PRIMERGY N800
Server System

Edition July 2001

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Introduction

Important notes

Installing the server

Preparation for use and operation

Configuration software and utilities

Property and data protection

Troubleshooting and tips

System expansions

SCSI configurations

Reference section and index

Contents

1	**Introduction**	**1**
1.1	Features	2
1.2	Target group	5
1.3	Summary of contents	6
1.4	Notational conventions	7
1.5	User-friendly documentation – verified quality	8
1.6	Technical data	9
2	**Important notes**	**11**
2.1	Notes on safety	11
2.2	Electrostatic-sensitive component label	13
2.3	CE certificate	14
2.4	RFI suppression	14
2.5	FCC notices (Federal Communications Commission)	14
2.6	Notes on mounting in the rack	15
2.7	Notes on transportation	15
2.8	Environmental protection	16
3	**Installing the server**	**19**
3.1	Unpacking the server	19
3.2	Mounting the server in the rack	20
3.3	Connecting and disconnecting cables	25
3.4	Routing cables	26
3.5	Connecting devices to the server	28
3.5.1	Universal ports	28
3.5.2	CAN bus connection	29
3.6	Connecting the server to line voltage	31
4	**Preparation for use and operation**	**33**
4.1	Controls and indicators	33
4.1.1	Control panel	33
4.1.2	Indicators for the internal SCSI drives	35
4.1.3	Controls and indicators for the CD-ROM drive	35
4.1.4	Controls and indicators for the floppy disk drive	35
4.1.5	Indicators for the power supplies	35
4.1.6	Indicators for the hot-plug PCI slots	35
4.1.7	Rear view	36
4.2	Switching the server on and off	37
4.3	Installing the operating system	38

4.4	Configuring the server and components	38
4.4.1	Changing the switch settings	39
4.5	Cleaning the server	43
5	**Configuration software and utilities**	**45**
5.1	Short cuts using a key combinations	45
5.2	Power-ON Self-Test (POST)	45
5.3	BIOS Setup	47
5.3.1	Starting BIOS Setup	48
5.3.2	Setup menus	49
5.3.3	Main Menu	51
5.3.3.1	Primary Master and/or Primary Slave submenu	52
5.3.3.2	Processor Information submenu	53
5.3.3.3	Keyboard Features submenu	54
5.3.4	Advanced Menu	55
5.3.4.1	PCI Configuration submenu	56
5.3.4.2	PCI Mode submenu	56
5.3.4.3	I/O Device Configuration submenu	57
5.3.4.4	Advanced Chipset Control submenu	59
5.3.5	Security Menu	60
5.3.6	Server Menu	62
5.3.6.1	System Management submenu	63
5.3.6.2	Server Management Information submenu	64
5.3.6.3	Console Redirection submenu	64
5.3.7	Boot Menu	65
5.3.8	Exit Menu	66
5.4	Utilities	67
5.4.1	System Setup Utility (SSU)	67
5.4.2	BIOS update	68
5.4.2.1	Preparations	68
5.4.2.2	BIOS and firmware update	69
5.4.2.3	Recovering BIOS	70
5.4.2.4	Changing the BIOS language	70
5.4.3	Installing graphic drivers	71
5.4.4	Symbios SCSI utility	71
5.4.5	Installing PCI hot-plug software	71
6	**Property and data protection**	**73**
7	**Troubleshooting and tips**	**75**
7.1	Power-on indicator remains dark	75
7.2	Server switches itself off	76
7.3	Screen remains dark	76
7.4	Flickering stripes on the monitor screen	77

7.5 No screen display or display drifts . . . 77
7.6 No mouse pointer displayed on the screen . . . 77
7.7 Floppy disk cannot be read/written . . . 78
7.8 Time and date are not correct . . . 78
7.9 System will not boot . . . 78
7.10 Drives are reported as “dead” . . . 79
7.11 Added drive reported defective . . . 79
7.12 Error messages on the screen . . . 79
7.13 Error messages on the LCD display . . . 80

8 System expansions . . . 85
8.1 Opening/closing the server . . . 85
8.1.1 Removing the front bezel . . . 85
8.1.2 Mounting the front bezel . . . 86
8.1.3 Removing/mounting the PCI bus hot-plug cover . . . 87
8.1.4 Removing/mounting the top cover . . . 88
8.2 SCSI hard disk drives . . . 89
8.2.1 Replacing SCSI hard disk drives . . . 91
8.3 Power supply units . . . 94
8.3.1 Replacing a power supply unit . . . 95
8.4 Fans . . . 96
8.4.1 Replacing a fan . . . 97
8.5 Boards in hot-plug PCI slot . . . 99
8.5.1 Replacing boards in the hot-plug PCI slot . . . 101
8.5.2 Adding a PCI board . . . 104
8.6 Processor expansion . . . 105
8.6.1 Removing/installing processor units . . . 107
8.7 Memory expansion . . . 108
8.7.1 Installing DIMMs . . . 110
8.7.2 Removing a memory module . . . 112
8.7.3 Installing a memory module . . . 114
8.8 RemoteView storage medium . . . 114
8.8.1 Configuring the RemoteView storage medium . . . 115
8.9 Remote Service Board . . . 116

9 SCSI configurations . . . 117
9.1 Addresses for SCSI devices . . . 117
9.2 Internal SCSI configurations . . . 118

Abbreviations . . . 119

Related publications . . . 125

Index . . . 127

1 Introduction

The PRIMERGY N800 system server is an enterprise server with 8-way processing power and offers highest performance by using the Intel profusion technology. It is easy to integrate and can easily satisfy the needs of a variety of high-performance applications such as, for example, use as a network server, multiuser server system or large database.

PRIMERGY N800 server systems offer a high level of data security and availability through highly developed hardware and software components. These include hot-swap-capable hard disk slide-in modules, hot-plug fans, hot-plug power supply units, server management *ServerView*, Prefailure Detection and Analyzing (PDA), and Automatic Server Reconfiguration and Restart (ASR&R).

Security functions in *BIOS-Setup* and on the system board protect the data on the server against manipulation. The lockable door of the rack offers additional security.

As your application requirements grow, you can upgrade your server with the following components:

- More powerful (700 MHz and higher) with new carrier (mezzanine) boards and/or additional processors
- An additional CPU board with cache coherency (CC) filters
- An additional memory board and additional memory
- Other peripheral devices
- Add-on PCI boards

The PRIMERGY N800 is supplied as a 19-inch rack-mounted model (compute node housing) and occupies seven height units (7 HU) in the rack.

1.1 Features

Processors and Memory

The server can accommodate up to eight Intel Pentium III Xeon™processors with a clock frequency of 700 MHz or 900 MHz. 1 MB and 2 MB second level cache are available.

The 700 MHz or 900 MHz processors are mounted on „Palmetto mezzanine“ carrier boards.

CAUTION!

In order to prevent a damage of the processors, pay attention that the processors are mounted on the corresponding carrier boards only.

Up to 32 GB Ram memory with ECC SDRAM technology are available.

Hard disk system

The hard disk system consists of four hard disk slide-in modules. Each module can accommodate a SCSI hard disk drive with a SCA (Single Connector Attachment) interface and a maximum height of 1 inch. The hard disk drives are accessible from the front of the system and connect to two LVDS/SCSI backplanes. The connection to the SCSI backplane is implemented via the SCA interface (no cable required) and allows the hard disk slide-in modules to be attached or detached easily (hot-plug). As part of the hot-plug implementation, a hard disk slide-in module with integrated heat dissipation is required. The drives are fastened to the slide-in module, which snaps into the chassis with a locking mechanism.

Externally accessible drives

A 3.5-inch floppy disk drive and an IDE-CD-ROM or DVD drive with 0,5-inch height are available. Additionally a 5,25-inch SCSI tape drive for backup can also be used.

The externally accessible drives are accessed from the front of the system.

The floppy disk drive, CD-ROM respectively DVD drive and backup drive are mounted in a common cage. The accessible drives can not be replaced during operation.

Power supply

The server is equipped with three power supplies. This ensures a power supply redundancy. If a defect occurs in one unit, the other units ensures unimpaired further operation. The defective power supply unit can be replaced during operation (hot-plug power supply).

Cooling

The server contains two independent cooling subsystems:

– The upper system for cooling the system board, the I/O board and the upper part of the control panel.

– The lower system for cooling the memory modules, drive cages and the power supplies.

Both subsystems offer redundant cooling capabilities. As shipped from the factory, the minimum configuration includes six fans in the upper cooling system and three power supplies (each with an integrated fan) in the lower cooling system

All chassis covers must be on the system for proper cooling.

Hot-plug PCI

The server is equipped with four PCI buses with six hot-plug PCI slots (33 MHz) and four hot-plug PCI slots (100 MHz). Boards in these slots can be replaced during operation if required.

High level of availability and failure protection

When accessing stored data, 1-bit-errors in the main memory are automatically recognized and corrected (ECC = Error Checking and Correction). The patented memory scrubbing function regularly starts up the EDC mechanism and thus ensures continuous data integrity.

ASR&R (Automatic Server Reconfiguration and Restart) tunes out defective system components during an automatic system reboot.

The Prefailure Detection and Analyzing Technology (PDA) reports the threat of system errors or problems to the system administrator so that preventative measures can be taken.

The hot-swap-capable hard disks provide additional protection.

Server management

Server management is implemented with the aid of the supplied *ServerView* software and PDA (Prefailure Detection and Analyzing) technology from Siemens. The PDA analyzes and monitors all components relevant to system reliability, thus enabling early detection of overload situations and appropriate counter-measures.

ServerView enables the management of all PRIMERGY servers in the network via a central console. Here *ServerView* supports the following functions:

- Temperature monitoring of the CPU and the surrounding area.
- Timer-controlled switch-on (Timer)
- Remote switch-on (Ring Indicator)
- Watchdog timer for Automatic Server Reconfiguration and Restart (ASR&R) in the event of failure of memory modules or processors.
- Pager message when rebooting system following an error
- Monitoring of PCI bus loading
- End-of-Life monitoring of the fans with timely indication before failure
- Watchdog timer for operating system monitoring and application monitoring
- Detailed status and error reports for bus systems, processors and main memory
- Statistics for service technicians (operating hours counter, counter for switch-on/switch-off cycles)
- Storage of error messages in the non-volatile SRAM memory

Further information on the ServerView server management is provided in the associated documentation (see “Related publications” on page 125).

ServerStart

You can configure the server quickly and purposefully with the *ServerStart* software provided. User-guided menus are available for installing the server operating systems.

Service and Support

The PRIMERGY N800 is service-friendly and modular (compute node housing), thus enabling quick and simple maintenance. With the optional Remote Test and Diagnosis System *RemoteView*, long-distance maintenance and service (remote) can also be performed.

Other features

- year 2000 support
- 3 years guarantee for the system unit
- 5 years spare parts supply
- take-back guarantee of old systems

1.2 Target group

This manual is intended for those responsible for installing the hardware and ensuring that the system runs smoothly. The operating manual contains all the information required for installing and operating your PRIMERGY N800.

Knowledge of the hardware and data transfer, as well as a basic knowledge of the operating system used, is required to understand the various expansion options. You should also have a good working knowledge of the English language.

1.3 Summary of contents

This manual describes the PRIMERGY N800, its installation and configuration, and how to install extensions/upgrades.

Further information is provided:

– in the “Safety, Warranty and Ergonomics” manual

– in the manual for the 19-inch rack

– in the manual for the monitor

– in the manual for *ServerView* server management

– in the manual for the remote test and diagnosis system *RemoteView*

– in the documentation for your operating system

– in the information files of your operating system

(see also the section “Related publications” on page 125).

This manual consists of the following chapters:

- **Important notes**
  In this chapter you will find information on safety which it is essential to observe when working with your server, and information about environmental protection.
- **Installing the server**
  This chapter describes the tasks involved in installing and operating the server.
- **Preparation for use and operation**
  This chapter describes the control panel, the indicators and the connection elements of the server in greater detail.
- **Configuration software and utilities**
  This chapter provides you with an introduction to the configuration software.
- **Property and data protection**
  This chapter describes how you can protect your system and your data against unauthorized access.
- **Troubleshooting and tips**
  This chapter provides you with help should you encounter problems when installing or operating the system.

- **System expansions**
  This chapter describes in more detail how you can expand your system using various components. It also explains how to replace defective components.
- **SCSI configurations**
  This chapter explains the SCSI-IDs for the hard disk drives and internal SCSI configurations.

1.4 Notational conventions

italic type	Identifies commands, menu items, names of buttons, options, variables, file names, path names and input within the body of the text.
`fixed-width type`	Used for messages and prompts on the screen.
Key symbols	Keys are shown as they appear on the keyboard. If an uppercase letter must be entered explicitly, the Shift key is also specified (e.g. SHIFT). A plus (+) sign between the key symbols indicates that these keys are to be pressed simultaneously.
bold type	Used for emphasis in the body of the text
"quotation marks"	Used for references to other chapters, sections or manuals
►	Identifies an action that you need to take
	Alerts you to additional information, notes and tips
CAUTION!	Warning sign indicating that your health, the correct functioning of your system or the security of your data may be at risk if you ignore the information given at this point.

Table 1: Notational conventions

1.5 User-friendly documentation – verified quality

As part of its efforts to further improve the information provided for users, the editorial department responsible for this manual has been independently audited to verify its high standards of quality of the documentation.

This audit was carried out by TÜV PRODUCT SERVICE GmbH. The following aspects were investigated:

– General comprehensibility
– User-friendliness
– Occupational hygiene and safety for the users
– Safety of the application and observance of the relevant regulations, standards and guidelines
– Environmental protection
– Layout, realization, readability
– Conformity with the product
– Accuracy and completeness of the contents

The criteria for the audit were developed in a joint project between TÜV PRODUCT SERVICE GmbH and tekom, Gesellschaft für technische Kommunikation e.V.

The DOCcert seal provides visible evidence of the successful completion of the audit.

1.6 Technical data

Electrical data	
Rated voltage range	100 V - 120 V 200 V - 240 V (auto sense)
Rated voltage tolerance	+6 % / -10 %
Frequency	50 Hz / 60 Hz
Rated current at 100V - 120 V	12 A
Rated current at 200V - 240 V	7 A
Effective power	1247 W
Apparent power	1271 VA
Heat emission	4014 kJh
Building fuse	16 A
Protection class	I

Dimensions and weight	
Height (mm)	312 (seven height units)
Width (mm)	445
Depth (mm)	712
Weight (kg)	max. 60 (maximum configuration)

Environmental conditions (according to DIN EN 60721-3-x)	
Operating climate (Class 3K2):	
Temperature (°C)	10 to 35
Relative humidity(%)	5 to 85
Environmental conditions/transport (Class 2K2):	
Temperature (°C)	-25 to 60
Relative humidity (%)	15 to 98
Mechanical environmental conditions	
Operation	Class 3M2
Transport	Class 2M2

Standards	
Product safety and ergonomics	IEC 60950 (DIN EN 60950), UL 1950, CSA 950, NEMKO
Electromagnetic compatibility	
Interference emission	EN 55022, Class A; FCC part 15, Class A
Interference immunity	EN 50082-1
CE certification	Low voltage directive LVD 73/23/EEC EMC Directive 89/336/EEC
Certification	GS, CSA NRTL/C, CB Certificate

Noise level (ISO 9296)	**Operation**	**Idle**
Sound power level (L_{WAd})	max. 5,5 B	max. 4,8 B
Operating sound pressure level (L_{pAm})	max. 43 dB(A)	max. 32 dB(A)

Maintenance surfaces and ventilation clearances
Depends on 19" rack

2 Important notes

2.1 Notes on safety

In this section you will find information that you must note when using the storage subsystem.

This device complies with the relevant safety standards for IT equipment, including electronic office machines, intended for use in the office environment.

Observe the safety instructions in the “Safety, Warranty and Ergonomics” manual and in the documentation for the connected PRIMERGY system.

If you have any questions relating to setting up and operating your system in the environment where you intend to use it, please consult our service organization.

CAUTION!

- The actions described in these instructions should only be performed by technicians, service personnel or technical specialists. Equipment repairs should only be performed by qualified staff. Any failure to observe the guidelines in this manual could expose the user to considerable risks (electric shock, fire hazards) and could also damage the equipment. Note that any unauthorized opening of the device will result in the invalidation of the warranty and exclusion from all liability.
- Transport the device in its original packaging or in other suitable packaging which will protect it against shock or impact.
- Read the notes on environmental conditions in section “Technical data” on page 9 before setting up and operating the device.
- If the device is brought in from a cold environment, condensation may form both inside and on the outside of the machine.

  Wait until the device has acclimatized to room temperature and is absolutely dry before starting it up. Material damage may be caused to the device if this requirement is not observed.
- Check that the rated voltage specified on the device's ID plate is the same as the local line voltage.

CAUTION!

- The device must only be connected to a properly grounded wall outlet (the device is fitted with a tested and approved power cable).
- Make sure that the wall outlet of the building‘s wiring system is freely accessible.
- Switching off the device does not cut off the supply of power. To do this you must remove the power plugs.
- Before opening the unit, switch off the device and then pull out the power plugs.
- Route the cables in such a way that they do not form a potential hazard (make sure no-one can trip over them) and that they cannot be damaged. When connecting up a device, refer to the relevant notes in this manual.
- Never connect or disconnect data transmission lines during a storm (lightning hazard).
- Systems which comprise a number of cabinets must use a separate fused socket for each cabinet.
- The system unit and the directly connected external storage subsystems should be connected to the same power supply distributor. Otherwise you run the risk of losing data if, for example, the central processing unit is still running but the storage subsystem has failed during a power failure.
- Make sure that no objects (such as bracelets or paper clips) or liquids fall into the device (risk of electric shock or short circuit).
- In emergencies (e.g. damage to housings, power cords or controls or ingress of liquids or foreign bodies), immediately power down the device, pull out the power plugs and notify your service department.
- Note that proper operation of the system (in accordance with IEC 60950/DIN EN 60950) is guaranteed only if slot covers are installed on all vacant slots and/or dummies on all vacant bays and the housing cover is fitted (cooling, fire protection, RFI suppression).

2.2 Electrostatic-sensitive component label

Electrostatic-sensitive components may be identified by the following sticker:

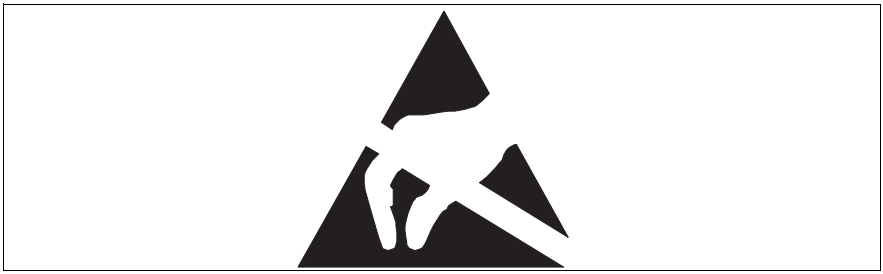

Figure 1: Electrostatic-sensitive component sticker

You must follow the instructions below when handling modules containing electrostatic-sensitive components:

- Discharge static electricity from your body (for example by touching a grounded metal object) before handling modules containing electrostatic-sensitive components.
- The equipment and tools you use must be free of static charge.
- Remove the power plug before installing or removing modules containing electrostatic-sensitive components.
- Only hold modules containing electrostatic-sensitive components by their edges.
- Do not touch any of the pins or track conductors on a module containing electrostatic-sensitive components.
- Use a grounding strap designed for the purpose, to connect you to the system unit as you install the modules.
- Place all components on a static-safe base.

An exhaustive description of the handling of modules containing electrostatic-sensitive components can be found in “Richtlinie zur Handhabung von elektrostatisch gefährdeten Bauelementen und Baugruppen (EGB)” or “ITS Circular 4/95”.

An ESD kit is available from Fujitsu Siemens Computers sales or an authorized dealer, under catalog number 8501 and stock number 06431046.

2.3 CE certificate

This device complies with the requirements of EU directives 89/336/EEC “Electromagnetic compatibility” and 73/23/EEC “Low Voltage Directive”. The device therefore qualifies for the CE (CE=Communauté Européenne) mark on the back of the device.

2.4 RFI suppression

Any other devices which are attached to this product must likewise comply in respect of RFI suppression with EU directive 89/336/EEC.

Products which meet this requirement are accompanied by a certificate to that effect issued by the manufacturer and/or bear the CE mark. Products which do not meet this requirement may be operated only with the special permission of the BZT (Bundesamt für Zulassungen in der Telekommunikation).

2.5 FCC notices (Federal Communications Commission)

Class A digital device

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2.6 Notes on mounting in the rack

- For safety reasons, at least two people are required to install the rack-mounted model because of its weight and size.
- When connecting and disconnecting cables, observe the notes in the documentation for your PRIMERGY system and the comments in the “Important notes” chapter in the corresponding rack operating manual supplied with the rack.
- Ensure that the anti-tilt bracket is correctly mounted when you set up the rack.
- For safety reasons, no more than one unit may be withdrawn from the rack at any one time during installation and maintenance work.
- If more than one unit is withdrawn from the rack at any one time, there is a danger that the rack will tilt forward.
- The power supply to the rack must be installed by an authorized specialist (electrician).

2.7 Notes on transportation

Transport the storage subsystem in its original packaging or in other suitable packaging which will protect it against shock or impact.
Do not unpack it until all transport maneuvers are completed.

If you need to lift or transport the storage subsystem, ask someone to help you.

2.8 Environmental protection

Environmentally friendly product design and development

This product has been designed in accordance with the FSC standard for “environmentally friendly product design and development”.

This means that the designers have taken into account important criteria such as durability, selection of materials and coding, emissions, packaging, the ease with which the product can be dismantled and the extent to which it can be recycled.

This saves resources and thus reduces the harm done to the environment.

Notes on saving energy

Devices that do not have to be on permanently should not be switched on until they need to be used and should be switched off during long breaks and on completion of work

Notes on packaging

We recommend that you do not throw away the original packaging in case you need it later for transportation. If possible, devices should be transported in their original packaging.

Notes on dealing with consumables

Please dispose of batteries in accordance with local regulations.

Notes on labeling plastic housing parts

Please avoid attaching your own labels to plastic housing parts wherever possible, since this makes it difficult to recycle them.

Take-back, recycling and disposal

For details on take-back and reuse of devices and consumables within Europe, contact your FSC branch office/subsidiary or our recycling center in Paderborn:

Fujitsu Siemens Computers
Recycling Center
D-33106 Paderborn

Tel. ++49 5251 8180-10

Fax ++49 5251 8180-15

Further information on environmental protection

The Fujitsu Siemens Computers representative for environmental protection will be happy to answer any further questions you may have concerning environmental protection.

Fujitsu Siemens Computers
Environmental Protection
Werner-von-Siemens-Straße 6
D-86159 Augsburg

Tel. ++49 821 599-2999

Fax ++49 821 599-3440

3 Installing the server

3.1 Unpacking the server

CAUTION!

Observe the safety information in the chapter “Important notes” on page 11.

Ask for assistance with carrying the server.

You are advised not to throw away the original packaging material. You may need it again later for transportation purposes.

- Unpack all the individual parts.
- Check the delivery for damage incurred during transport.
- Check whether the delivery matches the specifications in the delivery note.
- Check whether all the necessary details have been entered on the first page of the guarantee booklet.

Should you discover that damage has occurred during transport or that the delivery does not match the delivery note, notify your supplier immediately!

3.2 Mounting the server in the rack

CAUTION!

- Please take note of the safety information and the notes on mounting in the rack in the chapter “Important notes” on page 11.
- At least two people are needed to position the server in the rack.
- The rack may tip over if more than one heavy unit is removed.

Mounting the installation kit and the server

For mounting the server in the DataCenter Rack at first a support bracket must be mounted on the rear left support upright. The support bracket must be mounted level with the lower edge of the server. Cage nuts and/or spring nuts also must be inserted in the support uprights. The support bracket is used for the rear fixing of the left carrier rail, the cage nuts are used for fixing the support bracket and the front panel, the spring nuts for fixing the carrier rails:

► Take the fitting instruction in the Technical Manual for the corresponding rack model for aid.

► Using the mounting aid (stencil) mark the position of the attachment points of the server on the support uprights (7 height units).

Refer to the information on the mounting aid.

► Mount the support bracket using two screws and cage nuts on the corresponding height on the rear left support upright.

► If required, you can mount one additional a cable clip for vertical cable routing.

► Mark the mounting points of the server (knurled screws on the front panel) on the front support upright. Also mark the fastening points of the telescopic rails on the inside grooves of the support uprights facing backwards. The bottom edge of the fastening flange must be flush with the top housing cover of any device already mounted.

► Place the cage nuts and/or the spring nuts in the groove of the support uprights and/or of the support bracket at the marked attachment points. If necessary, adjust the position of the nuts in the groove until they lock into the correct position.

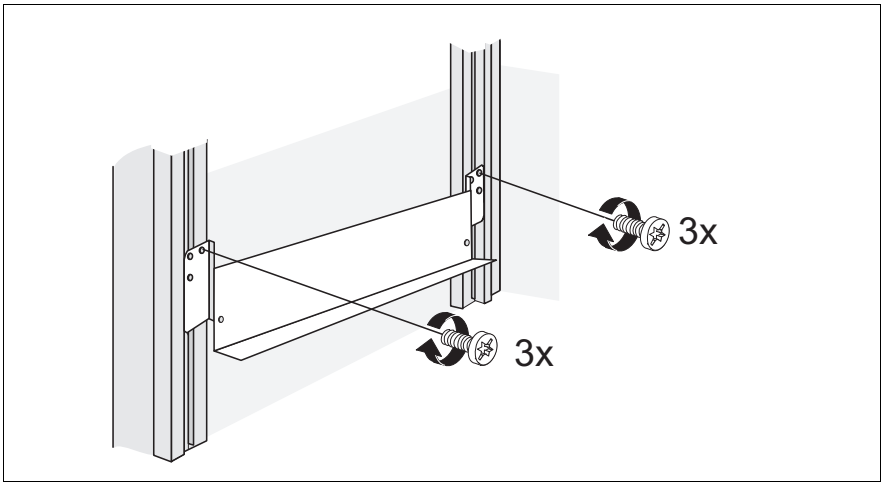

Figure 2: Mounting the carrier rails

► Secure the two telescopic carrier rails to the left and the right inside the rack using the Allen key no. 5 supplied. Note that there is a left and right carrier rail which differ in the arrangement of the tap holes. The figure shows the left carrier rail. When mounting the carrier rails, the guide nabs of the rails next to the spring nuts must fit into the holes of the support uprights.

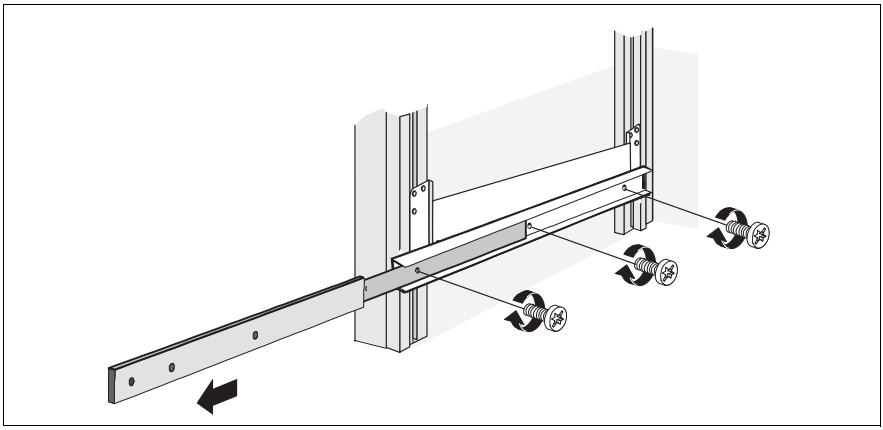

Figure 3: Mounting the telescopic rails onto the carriers

► First of all screw the fastening screws onto the telescopic rails

- ► Pull the left mounted telescopic rail out as far as it will go and then mount it to the appropriate carrier with the screws.
- ► Repeat this procedure for the right telescopic rail.

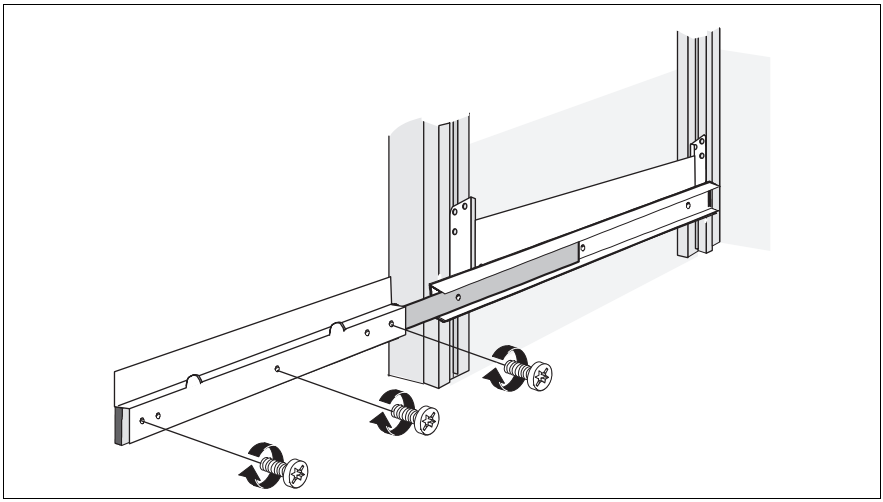

Figure 4: Mounting the system brackets

- ► Mount the system brackets on the two telescopic rails.
- ► Pull the mounted telescopic rails out completely. They must click into place so that you can no longer push them back.

i It takes more than one person to lift the storage subsystem into the rack.

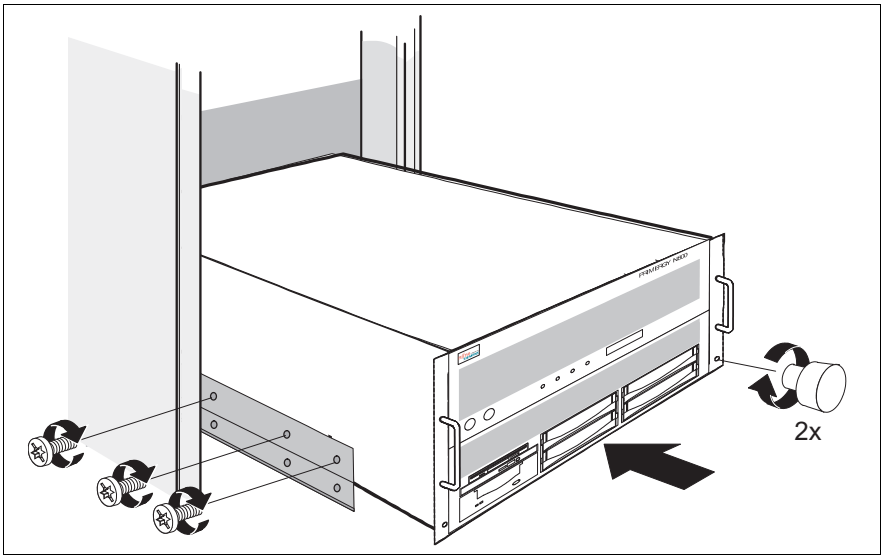

Figure 5: Mounting the server in the rack

- ► Place the server onto the two system brackets. Make sure that the metal noses grip the notches on the housing.
- ► Fasten the brackets to the right and left hand sides of the server (three screws each side).

The following steps require only one person.

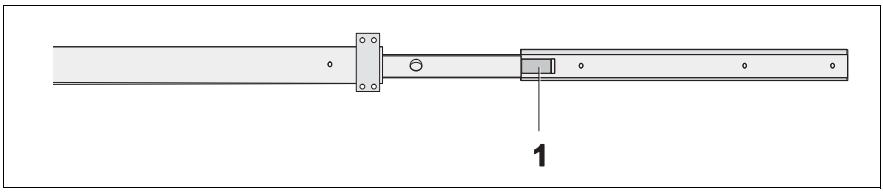

Figure 6: Telescopic rails with safety springs

- ► Press in the safety springs (1) on both telescopic rails.

For the case, that a rack server is installed in a 19-inch rack (without cord management) an articulated cable guide must be mounted at the device:

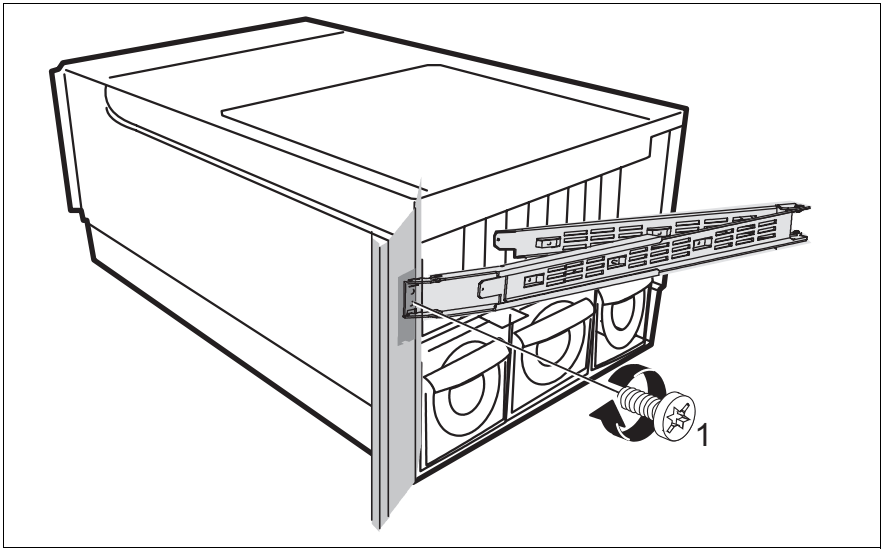

Figure 7: Mounting the articulated cable guide

- ► Insert two spring nuts in the groove of the rear right support upright at the same height with the connection cables of the server.
- ► Fix the cable guide with two mounting screws on the rear right support upright of the rack (1).

The articulated cable guide should now be mounted as shown in the figure.

- ► Slide the server into the rack.
- ► Fasten the server to the rack using the four knurled screws.

3.3 Connecting and disconnecting cables

CAUTION!

The power plug must be pulled out!
Read the documentation for the external device before you connect it.
Never connect or disconnect cables during thunderstorms.
When disconnecting a cable, always grasp the plug. Never pull on the cable!
Connect or disconnect cables in the order shown below.

Connecting cables

- All affected devices must be switched off.
- The power plug of all affected devices must be pulled from the socket.
- Attach all cables to the server and the storage subsystem. Mark the cables and note what function each cable serves. Above all, observe the safety notes in the chapter “Important notes” on page 11.
- Insert the power plugs into the grounded socket. Make sure that the power cables of the devices are plugged in so that an even distribution of power to the three phases (L1, L2, L3) in the rack is achieved (refer to the manual for the 19-inch rack for more information).
- For devices with articulated cable guides, secure the cables to the articulated cable guide with the cable ties.

Disconnecting cables

- Switch off all affected devices.
- Pull the power plugs of all affected devices out of the sockets.
- Disconnect all cables on the server and the storage subsystem.

3.4 Routing cables

19-inch Rack

The cables can be fastened to the articulated cable guide without restriction. This allows the server to be removed later without further preparation.

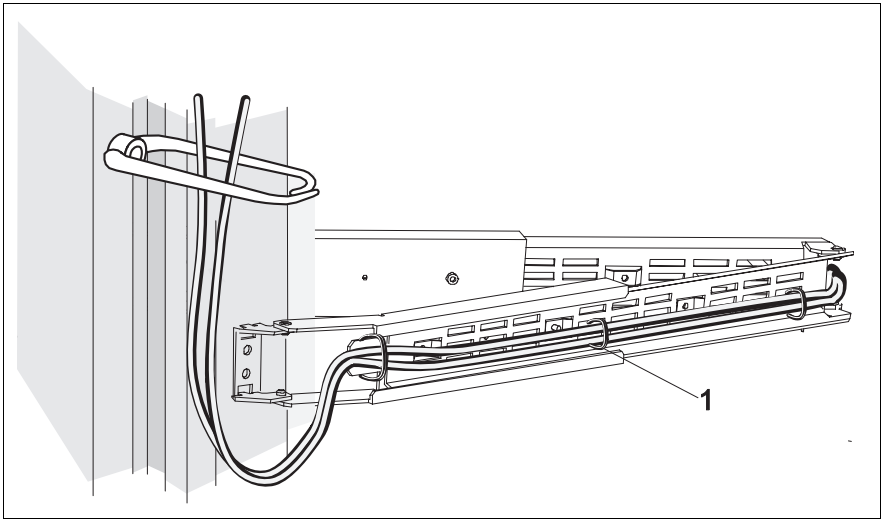

Figure 8: Cable routing

- ► Connect the cables to the server and the peripheral devices.
- ► Route the cables as shown in the figure.
- ► Route the cables through the cable channels.
- ► Fix the cables to the articulated cable guide with the cable ties (1).

DataCenter Rack

For installing the server in the DataCenter Rack at first the cable management system must be mounted. Further informations find you in the Technical Manual of the DataCenter Rack.

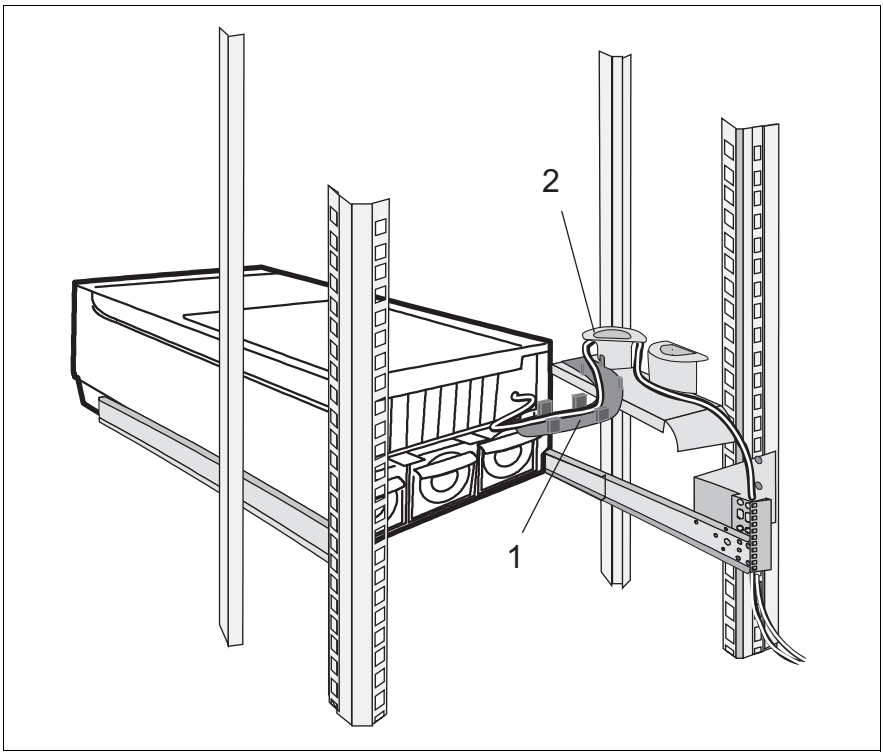

Figure 9: Routing the cables in the DataCenter Rack

- ► Route the cables in the articulated cable guide (1) of the cable management system and secure its using the delivered cable ties.
- ► Route the cables around the cable management guidance (2) (see figure 9 on page 27).
- ► Route the cables through the cable clips on the right support upright after having inserted the server (see Technical Manual of the Rack).
- ► Check to see if the server can be pulled out without breaking or even over-stretching the cables.

3.5 Connecting devices to the server

The ports for the devices are at the back of the server (see section “Rear view” on page 36). Which ports are available on your server depends on the PCI boards installed. The standard ports are indicated by symbols.

3.5.1 Universal ports

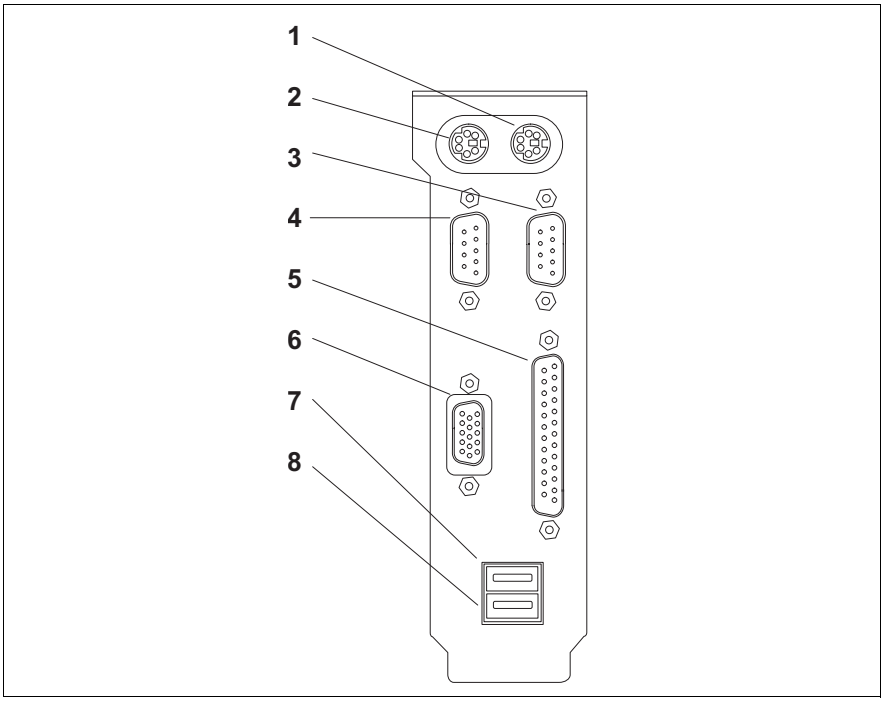

Figure 10: Universal ports

1	Mouse	5	Parallel port
2	Keyboard	6	Monitor
3	Serial port COM 1	7	USB port 0
4	Serial port COM 2	8	USB port 1

► Connect the data cables to the devices and the server.

Some of the connected devices require that you install and configure special software (e.g. drivers) (see the documentation for the connected device).

If you are using a separate graphics card in a slot, the graphics controller on the system board is automatically deactivated. The corresponding monitor port (SVGA) cannot be used. Instead, connect the data cable of the monitor to the monitor port of the graphics card.

3.5.2 CAN bus connection

Several servers and storage subsystem (e.g. PRIMERGY S40-DF) can be combined to form a group (functional unit, family/cluster). All the devices in a group are assigned the same group ID but different device IDs. This ID (CAN bus address) can be used to address each device using the communications bus (CAN bus). A maximum of ten groups can be set up on one communications bus. All the devices in a group must be connected to the same CAN bus.

The CAN bus is a cable connection. The CAN bus must be terminated, i.e. terminating resisters must be attached to free ends.

The server includes a PCI CAN bus controller (figure 11 on page 30), which enables communication with a PRIMERGY S40-DF in a cluster configuration.

Communication between the PCI CAN bus controller and the storage subsystems is enabled with the help of the ServerStart CD:

(*/Werkzeuge/Systemkonfigurationprogramme/SCU/Storage Extension*)

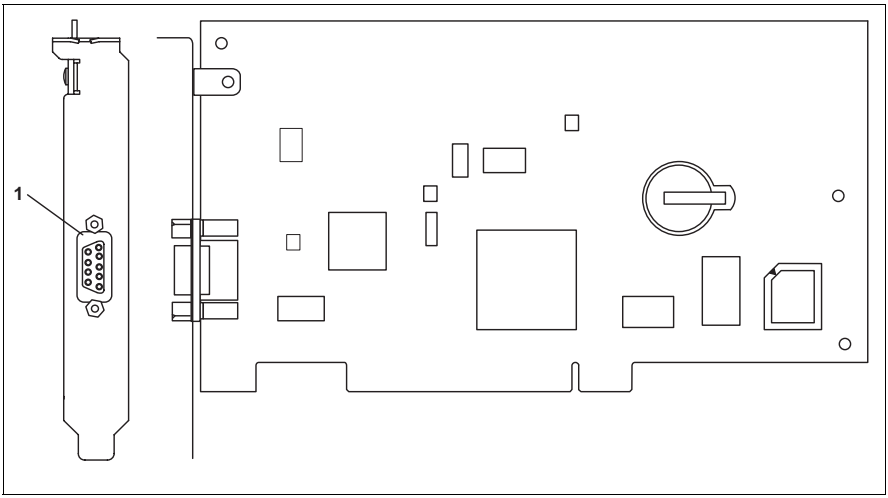

Figure 11: The PCI CAN bus controller

The CAN bus connector is located on the connection panel of the CAN bus controller board (inserted into a PCI slot) on the back of the server (see figure 11 on page 30 and figure 13 on page 36).

Optical fiber transmission can be used to bridge longer distances between the PRIMERGY server and the PRIMERGY S40-DF, i.e. the CAN bus connection is made via multi mode fiber technology (for further information, see the documentation for CAN-MMF).

ServerView and the CAN bus

ServerView uses the CAN bus for communication with the clients.

This involves setting up ServerView, including the corresponding agents, in the group of servers and storage subsystems to be monitored. ServerView can then receive information on the status of the fans, temperature and other important system components from all the members in the group (e.g. the storage subsystem) via the CAN bus. ServerView evaluates this information and edits it for the administrator (Manager) for display or forwarding. Refer to the ServerView manual for more information (see “Related publications” on page 125).

i A retrofitted PCI CAN bus controller will be identified by ServerView after an update of the installed ServerView Client only.

RemoteView (RTDS), SEMAN and the CAN bus

The update of the firmware and the testing and diagnosis of the storage subsystem can only be performed via the CAN bus and using SEMAN (included on the ServerStart CD) or the optional RemoteView (remote test and diagnostics system). Refer to the RemoteView manual for more information (see “Related publications” on page 125).

3.6 Connecting the server to line voltage

The server is equipped with a modular, hot-plug power supply consisting of a maximum of three power supply units. A redundant power supply can be set up with a third power supply unit. If a defect occurs in one unit, the other unit ensures unimpaired further operation. The defective unit can be replaced during operation.

The power supply units automatically adjust to a voltage range from 100V to 120V or 200V to 240V.

- ► Plug the server’s power cord into the insulated socket on the server (see figure 13 on page 36) and into a free socket on the connector strip on the rack (see the technical manual for the rack).

4 Preparation for use and operation

CAUTION!

Observe the safety information in the chapter “Important notes” on page 11.

4.1 Controls and indicators

4.1.1 Control panel

The control panel is located on the front of the server between the fan cage and the drive cage.

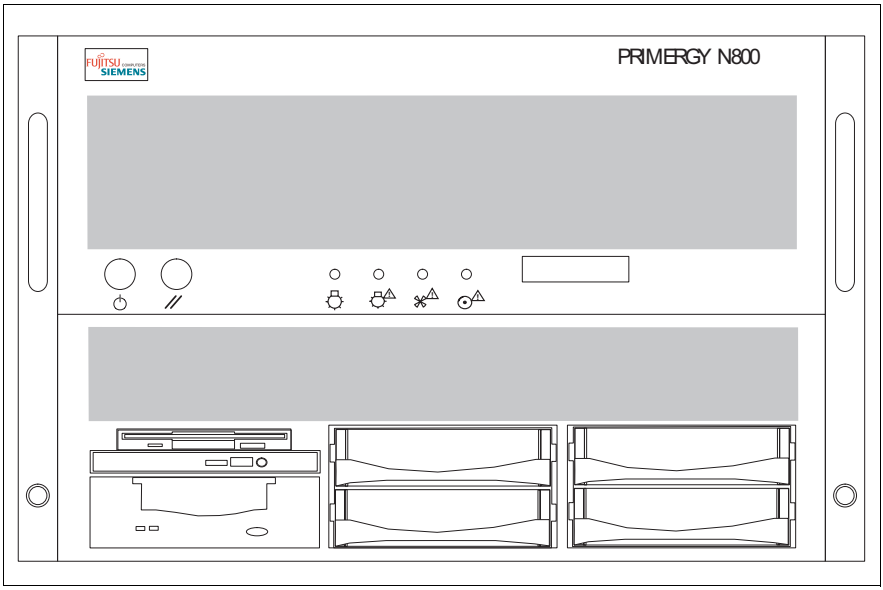

Figure 12: Front view

ON/OFF button: When the system is switched off, the system is switched on by pressing the ON/Off button. When the system is operating, pressing the ON/OFF button will switch off the system.

The ON/OFF button does not disconnect the server from the line voltage. To disconnect from the line voltage, remove the power plug from the power outlet.

Reset button: Pressing the Reset button reboots the system. The Power-ON Self-Test (POST) is started.

Power-on indicator: Lights up green when the server is switched on and DC power is present in the server.

Does not light up if the server is switched off or if the power supply has been interrupted.

Power failure indicator: Lights up yellow if DC power is not present in the server.

Fan failure indicator: Lights up yellow if a fan has failed.

Drive error: Lights up yellow if an error status exists for one or more hard disks in the drive cage.

Blinks yellow if a hard disk reset is being performed.

LCD display field:

Information about the processor type and error codes are displayed on the LCD display field (see the section “Error messages on the LCD display” on page 80).

NMI button: Pressing on the NMI button causes a non-maskable interrupt. This button is located behind the front panel to prevent inadvertent activation. It must be pressed with a narrow tool (not supplied).

4.1.2 Indicators for the internal SCSI drives

The internal SCSI drives are located on the front of the server. The status of each SCSI drive is indicated by two LEDs (see table 24 on page 91).

4.1.3 Controls and indicators for the CD-ROM drive

The CD-ROM drive is located in the drive cage in the bay for externally accessible drives on the front of the server. The CD-ROM drive is equipped with the following controls and indicators:

Open/close button:	When pressed briefly (<1 second), this button opens or closes the CD-ROM tray.
Power-on indicator:	Lights up green when the CD-ROM drive is in use.
Volume control:	Adjusts the volume of the headphones or speakers.

4.1.4 Controls and indicators for the floppy disk drive

The floppy disk drive is located above the CD-ROM drive. The floppy disk drive is equipped with the following controls and indicators:

Power-on indicator:	Lights up green when the floppy disk drive is in use.
Eject button:	Pressing briefly on this button ejects the floppy disk.

4.1.5 Indicators for the power supplies

The power supplies can be accessed from the back of the server. The status of each power supply is indicated by three LEDs (see table 25 on page 95).

4.1.6 Indicators for the hot-plug PCI slots

Each hot-plug PCI slot is equipped with two pairs of LEDs (hot-plug indicators) which indicate the current status of the slot (see table 26 on page 100). One pair of LEDs is visible on the back of the server from the outside. The other pair is located inside the server in near the slot with the PCI hot-plug locking mechanism.

4.1.7 Rear view

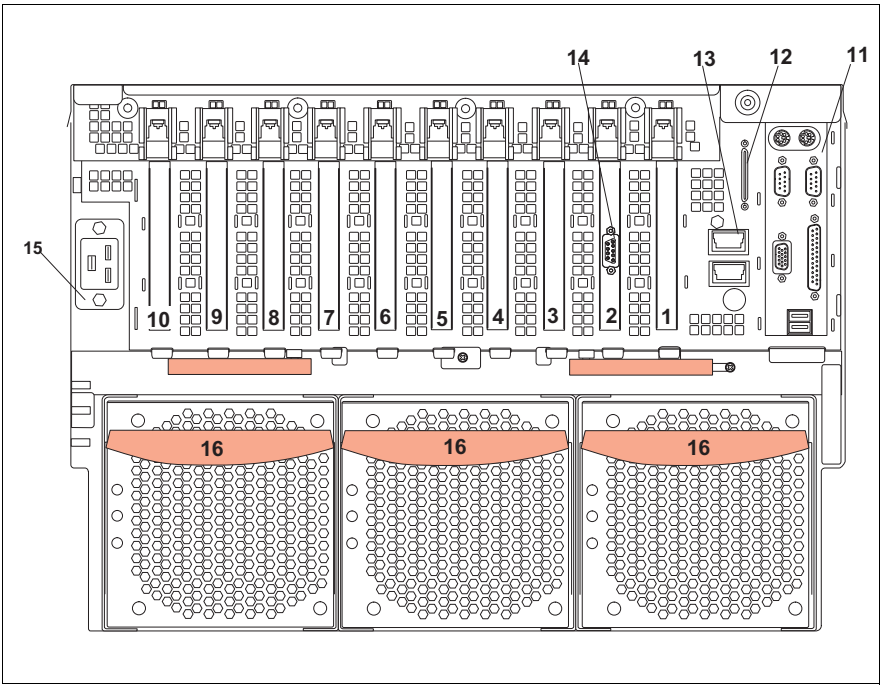

Figure 13: Rear view of server

1-6	PCI-B3 slots 33 MHz
7-10	PCI-B3 slots 100 MHz
11	Universal ports (see section “Universal ports” on page 28)
12	External SCSI LVD SE connector
13	ICMB (Interchassis Management Bus) connector
14	RSB (optional)
15	CAN-bus service board (optional)
16	Power connector
17	Power supplies

4.2 Switching the server on and off

CAUTION!

If after switching on the server there is nothing but flickering stripes on the screen, switch the server off immediately (see the chapter “Trouble-shooting and tips” on page 75, section “Flickering stripes on the monitor screen” on page 77).

The ON/OFF button does not disconnect the server from the line voltage. To disconnect from the line voltage completely, remove the power plug from the power outlet.

Server is switched off

► Press the ON/OFF button.

The server switches on, performs the Power-ON Self-Test (POST) after a few seconds, and starts the operating system.

Server is switched on

► Shut down the operating system in an orderly manner.

► Press the ON/OFF button.

The server switches off.

Other ON/OFF possibilities

In addition to using the ON/OFF button, the server can also be switched on/off in the following ways:

– Specified **switch-on/**switch-off time

  The time at which the server switches on or off is set in the ServerView program.

– **Ring indicator**

  The server is switched on via an internal or external modem. The key switch must be in the Remote position.

– **Following a power failure**

  The server automatically reboots following a power failure.

4.3 Installing the operating system

- ► Insert the ServerStart CD and keep ready the CD of the operating system you want to install.
- ► Reboot the server.
- ► Follow the instructions on the screen and in the manual for the operating system.

If your server is equipped with a disk array controller, please read in the appropriate manual how to configure the disk array before you install the desired system.

4.4 Configuring the server and components

The configuration software and utilities supplied with the product make it easy for you to configure the server and its components (see the chapter “Configuration software and utilities” on page 45).

The I/O board has a block of eight DIP switches (see figure 14 on page 40) for setting various configuration options (see the section “BIOS Setup” on page 47). Upon delivery, all the switches are set to the OFF position. table 2 lists the functions of the various DIP switches:

Switch		**Function**	**Description**
No.	**Pos.**		
1	OFF	Normal Boot	The system attempts to boot using BIOS code from the flash memory.
	ON	Recovery Boot	The system attempts a recovery boot by loading the BIOS code from a floppy disk into flash memory. This procedure is normally performed when BIOS code has been corrupted.
2	OFF	No CMOS Clear	Preserves the contents of NVRAM.
	ON	CMOS Clear	Replaces the contents of NVRAM with the default settings.

Table 2: DIP switches settings

Switch		Function	Description
No.	**Pos.**		
3	OFF	No Password Clear	Retains the password.
	ON	Password Clear	Clears the current system password.
4	OFF	NOP	Reserve
	ON	NOP	Reserve
5	OFF	PHP Switch	Hot-plug PCI slots, mechanical switches activated
	ON	PHP Switch	Hot-plug PCI slots, mechanical switches deactivated.

Table 2: DIP switches settings

4.4.1 Changing the switch settings

CAUTION!

Observe the safety information and the information on handling electrostatic-sensitive components in the chapter “Important notes” on page 11).

- ► Shut down the server and switch it off.
- ► Switch off all connected peripheral devices.
- ► Disconnect the server from the line voltage by removing the power cable from the power outlet.
- ► Remove the PCI hot-plug cover (see the section “Removing/mounting the PCI bus hot-plug cover” on page 87).
- ► Set the switches to the desired settings (see figure 14 on page 40).
- ► Mount the PCI hot-plug cover (see the section “Removing/mounting the PCI bus hot-plug cover” on page 87).
- ► Reconnect the server to the line voltage and switch the system on for the change to take effect.

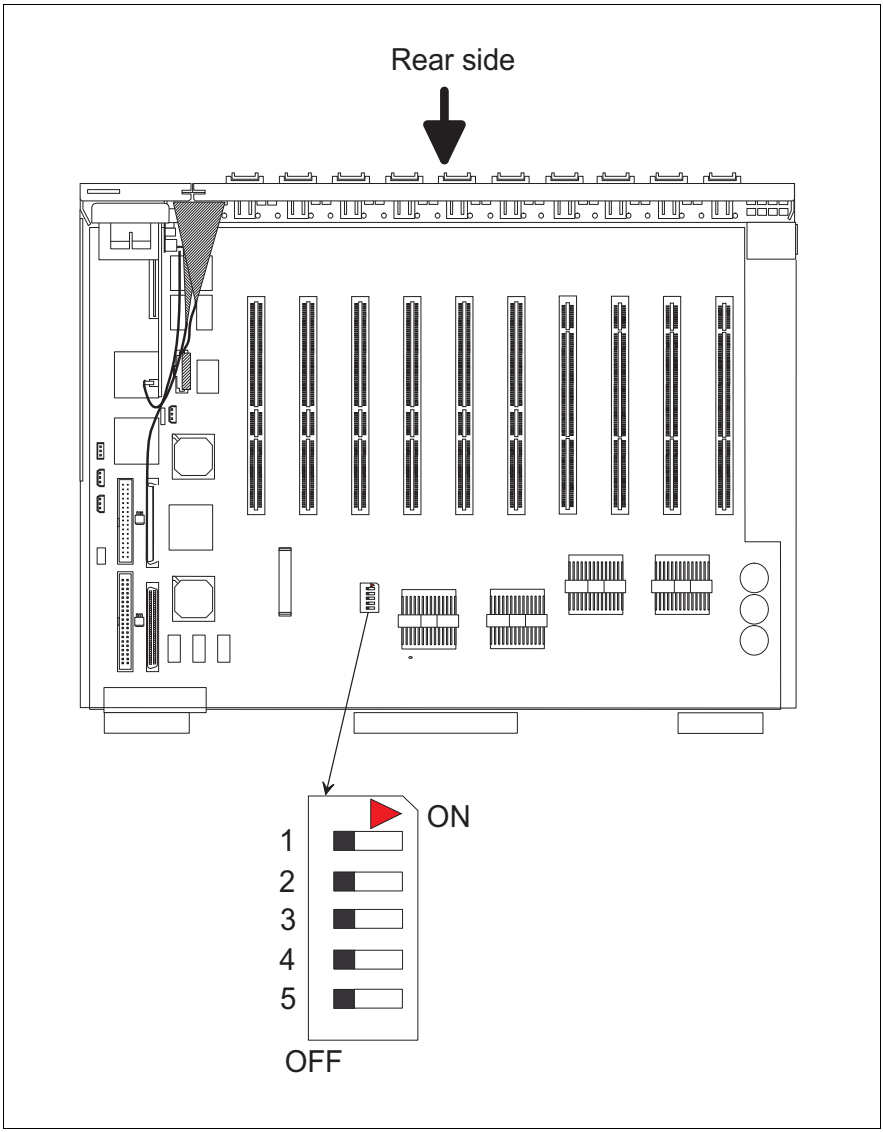

Figure 14: I/O board/configuration switches

Recovery Boot:

This switch controls whether the system attempts to boot using the BIOS code stored in flash memory, or, if the BIOS code is corrupt, whether a recovery boot is performed by loading the BIOS code from a floppy disk into flash memory.

If you want to start a recovery boot, proceed as follows:

- ► Follow the procedure described in the section “Changing the switch settings”.
- ► Set DIP switch 2 (see table 2 on page 38) to ON.
- ► Insert the flash memory update floppy disk in drive A.
- ► Turn on the system.

  After the system boots, a single beep is emitted and the recovery process is started. This takes about three minutes. Once the recovery process has been completed, two beeps are emitted.

  During recovery, there is no screen display on the monitor and the keyboard is disabled.

  The following beep sequences indicate the recovery status:

Beep sequence	**Meaning**
2	Successful completion, no errors.
4	The system could not boot from the floppy disk. The disk may not be bootable.
Continuous series of low beeps	The corrupt BIOS recovery files were used, or the flash memory switch is in the wrong position.

- ► Shut down the system, turn off the server and disconnect it from the line voltage.
- ► Set DIP switch 2 (see table 2 on page 38) to OFF.
- ► Remove the floppy disk from drive A.
- ► Reconnect all the peripheral devices, reconnect the server to the line voltage and switch it on.
- ► Run *BIOS Setup* to enter a new password (see the section “BIOS Setup” on page 47).

CMOS Clear:

This switch controls whether settings stored in non-volatile CMOS memory (NVRAM) are retained when the system is reset or whether the default settings are loaded.

If you want to change the settings in NVRAM, proceed as follows:

- ► Follow the procedure described in the section “Changing the switch settings” on page 39.
- ► Set DIP switch 2 (see table 2 on page 38) to ON.
- ► Switch the system on. Wait for POST to complete and for the following messages to be displayed on the screen:

  ```
  NVRAM cleared by jumper
  Press [F2] to enter Setup
  ```

  This reprograms CMOS and RTC to the default settings, except for the password.
- ► Press F2 to start *BIOS Setup* and make any necessary changes. Press F10 to save the new settings and exit Setup.
- ► Shut down the system, turn the server off and disconnect it from the line voltage.
- ► Reset DIP switch 2 (see table 2 on page 38) to OFF.
- ► Reconnect all peripheral devices, reconnect the server to the line voltage, and switch the server on.
- ► Run *BIOS Setup* to save the desired settings (see section “BIOS Setup” on page 47).

Password Clear:

This switch controls whether the current password is retained or cleared when the system is reset.

If you want to change the current password, proceed as follows:

- ► Follow the procedure described in the section “Changing the switch settings”.
- ► Set DIP switch 3 (see table 2 on page 38) to ON.
- ► Switch the system on. Wait for POST to complete. This clears the current password.
- ► Shut down the system, turn the server off and disconnect it from the line voltage.
- ► Reset DIP switch 3 (see table 2 on page 38) to OFF.
- ► Reconnect all peripheral devices, reconnect the server to the line voltage, and switch the server on.
- ► Run *BIOS Setup* to enter a new password (see section “BIOS Setup” on page 47).

4.5 Cleaning the server

CAUTION!

Switch off the server and pull the power plugs from the grounded insulated sockets.

Only authorized service personnel are allowed to clean inside the server.

Do not use any cleaning agents that contain abrasives or may corrode plastic.

Ensure that no liquid enters the system and that the ventilation areas of the server and monitor remain clear.

You can use a disinfection cloth to clean the outside of the keyboard and the mouse.

Wipe the server and monitor casing with a dry cloth. If particularly dirty, use a cloth that has been moistened in mild domestic detergent and then carefully wrung out.

5 Configuration software and utilities

This chapter describes the Power-ON Self-Test (POST) and the configuration software.

5.1 Short cuts using a key combinations

Use the numeric pad on the keyboard to enter numbers and symbols.

	Key combinations
Clear memory and reload the operating system, i.e. system reset	Ctrl + Alt + Del
Save system immediately	Ctrl + Alt +hotkey (set your hot-key combination with *BIOS Setup*.)
Call BIOS Setup during POST	F2

Table 3: Key combinations

5.2 Power-ON Self-Test (POST)

Every time you turn on the system, the POST starts. It checks the boards, processors, memory, keyboard and most installed devices. During the memory test, POST displays the amount of memory it is able to access and test. The length of time needed to test memory depends on the amount of memory installed. POST is stored in flash memory.

► Turn on your monitor and the system. POST starts up after a few seconds.

After the memory test, the following screen prompts and messages are displayed:

```
Keyboard Detected
Mouse Initialized
Press F2 to enter Setup
```

► Press F2 to start *BIOS Setup* and configure the settings.

If you do not press F2, the boot process continues and the following message is displayed:

```
Press Alt + Q to enter SCSI Utility
```

If you do not press F2 and do not have a hard disk drive with an operating system installed or a CD with the operating system in the CD-ROM drive, this message remains on the screen for a few seconds while the boot process continues, and the system beeps once. Then the following message is displayed:

```
Operating System not found
```

In this case, install the operating system first.

► Press the key combination Ctrl + C to call the SCSI utility (only if SCSI devices are installed). Follow the instructions displayed on the screen to configure the onboard SCSI host adapter and to run the SCSI utilities (see also the section “QLogic SCSI utility” on page 72).

If you do not call the SCSI utility, the boot process continues.

► Press Esc during POST to access a boot menu when POST has finished. You can choose the boot device or start *BIOS Setup* from this menu.

The system emits a beep to indicate that POST has been completed.

What appears next on your screen depends on whether an operating system is installed on your server and which operating system is involved.

If the system stops before the POST has been completed, it emits a beep code to indicate a critical system error that requires immediate attention. If POST messages are displayed on the screen, the system beeps twice when the message appears.

Take note of the messages displayed and write down the beep code you hear since this information is useful to your service representative. You will find a list of the beep codes generated by POST and error message in the chapter “Troubleshooting and tips” on page 75.

5.3 BIOS Setup

This section describes the options available for *BIOS Setup*. Use Setup to change the default system parameters. You can run *BIOS Setup* with and without the installed operating system. Setup stores most of the configuration values in battery-backed CMOS; the rest of the configuration is stored in flash memory. The configuration takes effect when you boot the system. POST uses these values to configure the hardware. If the values and the actual hardware do not match, POST generates an error message. You must then run *BIOS Setup* to correct the configuration.

You can use *BIOS Setup* to change default settings such as:

– Select floppy disk drive
– Select parallel port
– Select serial port
– Set time/date (is stored in RTC)
– Configure IDE disk drive
– Specify boot sequence
– Enable SCSI BIOS

Recording Setup settings

Record your Setup settings in a list. If the default values ever need to be restored (after a CMOS clear, for example), you must run Setup again. The information in the list could make your task easier.

You cannot call BIOS Setup

If the floppy disk drive is incorrectly configured and you cannot start *BIOS Setup* from the floppy disk, you may have to clear CMOS memory. To do this you have to change the switch setting on the I/O board (see the section “Configuring the server and components” on page 38).

Afterwards run *BIOS Setup* to check and change the settings for the floppy disk drive, and then return the switch to its original position.

5.3.1 Starting BIOS Setup

You can call and use *BIOS Setup* under different circumstances:

– When you turn on the system, after the POST memory test has been completed

– When you reboot the system by pressing Ctrl + Alt + Del in DOS mode

– When you have moved the CMOS clear switch to the ON position (enabled) (see the section “Configuring the server and components” on page 38)

In the three above-mentioned cases, you will see the following prompt after the system has booted:

```
Press F2 to enter SETUP
```

► Press F2 to enter *BIOS Setup*.

In a fourth case, i.e. if CMOS/NVRAM has been corrupted, you will see other prompts but not the F2 prompt:

```
Warning: CMOS checksum invalid
Warning: CMOS time and date not set
```

In this case, BIOS will load the default values into CMOS and attempt to boot.

When you see the F2 prompt once more, set anew the System Time and the System Date with the Main Menu of the *BIOS-Setup* (see section “Main Menu” on page 51)!

5.3.2 Setup menus

Setup provides six main menus and a number of submenus:

Pos.	Main menu	Submenu 1	Submenu 2
1	Main Menu	Primary Master	
		Primary Slave	
		Processor Information	
		Keyboard Features	
2	Advanced Menu	PCI Configuration	PCI Mode
		I/O Device Configuration	
		Advanced Chipset Control	
3	Security Menu		
4	Server Menu	System Management	System Management Information
		Console Redirection	
5	Boot Menu	Boot Device Priority	
		Hard Drive	
6	Exit Menu		

Table 4: Setup menus

Display	Meaning
A menu option is displayed on the screen but you cannot select it or move to that field.	You cannot change or configure the option in this menu. Either the option is configured or detected automatically, or you must select a different menu.
The prompt “Press Enter” is displayed next to an option.	Press ↵ to display a submenu that either uses the entire screen or a pull-down menu with one or more items.

Table 5: Explanation of what you see displayed on the screen

The table below lists the selection options displayed on the screen after you press F2 (start *BIOS Setup*). Not all the options are described since many are self-explanatory. Several of the options are only displayed for information purposes (they cannot be selected):

Key	Meaning
F1	Get help about a menu item
Esc	Return to previous item.
↑	Select the previous value in a list of menu items.
↓	Select the next value in a list of menu items.
← →	Select a main menu.
-	Reset current value to the previous value.
+	Change current value to the next higher value.
↵	Call submenus, select options and change values

F9	Display the following message:
	`Setup Confirmation`
	`Load default configuration now?`
	`[Yes] [No]`
	CAUTION!
	The *Yes* button is highlighted. If you now press ↵, all the Setup fields are reset to the default values.
	If you press Esc or select *No*, the server returns to the configuration it had before you pressed F9, without affecting any of the entries in the existing fields.

F10	Display the following message:
	`Setup Confirmation`
	`Save configuration changes and exit now?`
	`[Yes] [No]`
	CAUTION!
	The *Yes* button is highlighted. If you now press ↵, all the current Setup values are saved and the system is rebooted.
	If you press Esc or select *No*, the server returns to the configuration it had before you pressed F10, without affecting any of the entries in the existing fields.

Table 6: Selection options

5.3.3 Main Menu

Default values are in bold typeface.

Menu item	Option	Description
System Time	HH:MM:SS	Set the system time. To select a field, press Tab, ⇧+Tab or ↵. Then enter a new value. If you replace the battery, the time is set to 00:00. (This is a 24-hour clock.)
System Date	MM/DD/YYYY	Set the system date. To select a field, press Tab, ⇧+Tab or ↵. Then enter a new value. If you replace the battery, the default date is set to January 1990.
Legacy Diskette A:	Disabled 360 KB, 5 ¼” 1.2 MB, 5 ¼” 720 KB, 3 ½” **1.44/1,25 MB, 3 ½”** 2.88 MB, 3 ½”	Select the floppy disk type for drive A: (The 1.25 MB, 3.5-inch option corresponds to a 1024 byte/sector media format. To support the 1.25 MB, 3.5-inch option, you need a 3.5-inch, 3-mode floppy disk drive.)
Legacy Diskette B:	**Disabled** 360 KB, 5 ¼” 1.2 MB, 5 ¼” 720 KB, 5 ¼” 1.44/1,25 MB, 3 ½” 2.88 MB, 3 ½”	Select the floppy disk type for drive B: (The 1.25 MB, 3.5-inch option corresponds to a 1024 byte/sector media format. To support the 1.25 MB, 3.5-inch option, you need a 3.5-inch, 3-mode floppy disk drive.)
Primary Master		Select the *Primary Master* submenu. Press ↵ for options.
Primary Slave		Select the Primary Slave submenu. Press ↵ for options.
Processor Information		Select the *Processor-Information* submenu. Displays information about all the processors. You cannot modify any of the items in this menu. Consult your system administrator if an item needs changing.

Table 7: Main menu options

Menu item	Option	Description
Keyboard Features		Select the *Keyboard Features* submenu. Press ↵ for options.
Language	**English (US)** Français Deutsch Italiano Español	Select the display language for BIOS.

Table 7: Main menu options (continued)

5.3.3.1 Primary Master and/or Primary Slave submenu

Menu item	Option	Description
Autotype Fixed Disk	Press ↵	If you press ↵, BIOS attempts to determine the drive type for drives that comply with ANSI specifications. If successful, the remaining values in the menu fields are entered automatically.
Type	User	You enter the parameters of the hard disk drive installed at this connection.
	Auto	The type of hard disk drive installed is detected automatically.
	1-39	You can select pre-determined type of hard disk drive installed.
	CD-ROM	A CD-ROM drive is installed.
	ATAPI Removable	Removable disk drive is installed.
Cylinders		Displays the number cylinders.
Heads		Displays the number of read/write heads.
Sectors		Displays the number of sectors per track.
Maximum Capacity		Displays the capacity of the drive.
Multisector Transfers	Disabled 2, 4, 8, or 16 sectors	Displays the status of multisector transfers. Automatic BIOS entry.
LBA Mode Control	Disabled Enabled	Displays the status of Logical Block Access. Automatic BIOS entry.

Table 8: IDE options

Menu item	Option	Description
32-bit I/O	**Disabled** Enabled	*Enabled* allows 32-bit IDE data transfer.
Transfer Mode	Standard Fast PIO 1, 2, 3, or 4	Selects the mode for transferring data to/from the drive. Automatic BIOS entry.
Ultra DMA Mode	Disabled Mode 0, 1, or 2	Selects the Ultra-DMA mode for transferring data to/from the drive. Automatic BIOS entry.

Table 8: IDE options (continued)

5.3.3.2 Processor Information submenu

This menu displays information about all the processors. You cannot modify any items on this menu. Consult your system administrator if you need to change an item.

Menu item	Description
Left Processor 1 Stepping ID	Displays processor stepping.
Left Processor 1 L2 Cache Size	Displays the L2 cache size.
Left Processor 2 Stepping ID	Displays processor stepping.
Left Processor 2 L2 Cache Size	Displays the L2 cache size.
Left Processor 3 Stepping ID	Displays processor stepping.
Left Processor 3 L2 Cache Size	Displays the L2 cache size.
Left Processor 4 Stepping ID	Displays processor stepping.
Left Processor 4 L2 Cache Size	Displays the L2 cache size.
Right Processor 1 Stepping ID	Displays processor stepping.
Right Processor 1 L2 Cache Size	Displays the L2 cache size.
Right Processor 2 Stepping ID	Displays processor stepping.
Right Processor 2 L2 Cache Size	Displays the L2 cache size.
Right Processor 3 Stepping ID	Displays processor stepping.
Right Processor 3 L2 Cache Size	Displays the L2 cache size.
Right Processor 4 Stepping ID	Displays processor stepping.
Right Processor 4 L2 Cache Size	Displays the L2 cache size.

Table 9: Processor information

5.3.3.3 Keyboard Features submenu

Menu item	Option	Description
Numlock	**Auto** On Off	Activates numlock status at startup.
Key Click	**Disabled** Enabled	Activates key click.
Keyboard autorepeat rate	**30/sec.** 26,7/sec. 21,8/sec. 18,5/sec. 13,3/sec. 10/sec. 6/sec. 2/sec.	Selects key repeat rate.
Keyboard autorepeat delay	1/4 sec. **1/2 sec.** 3/4 sec. 1 sec.	Selects delay before key repeat.

Table 10: Keyboard options

5.3.4 Advanced Menu

CAUTION!

Setting incorrect values in this menu may cause your system to malfunction.

Menu item	Option	Description
Processor Serial Number	Disabled **Enabled**	Processor serial number control
Reset Configuration Data	**No** Yes	Clears system configuration data.
Use Multiprocessor Specification	1.1 **1.4**	Specifies the multiprocessor specification revision level. Some operating systems require revision level 1.1. for compatibility.
Large Disk Access Mode	CHS **LBA**	Selects the access method for IDE drives. Most operating systems use logical block addressing (LBA). However, some operating systems use the cylinder head sector (CHS). Refer to the operating system manual for further information.
Pause Before Boot	**Disabled** Enabled	Causes a 5-second pause before the operating system is booted.
Hot-plug PCI Master Control	**Disabled** Enabled	Set this to “Enable” to create the hot-plug PCI resource table.
Hot-plug PCI Allocation Level	Disabled **Minimum** Maximum	Set amount of resources to allocate to empty hot-plug PCI slots.
Time-out on POST Errors	Enabled	Operating system boots after 5 sec. of displaying POST errors.
	Disabled	Operating system waits for user to press F1 or F2.

Table 11: Advanced options

Menu item	Option	Description
PCI Configuration		*Selects the PCI Configuration* submenu.
I/O Device Configuration		*Selects the I/O Device Configuration* submenu.
Advanced Chipset Control		*Selects the Advanced Chipset Control* submenu.

Table 11: Advanced options (continued)

5.3.4.1 PCI Configuration submenu

Menu item	Option	Description
Processor Bus	100 MHz	Displays the clock speed of the Processor Bus.
PCI Slots 1-2	PCI 33	Displays the clock speed and setting of PCI Segment A.
PCI Slots 3-6	PCI 33	Displays the clock speed and setting of PCI Segment B.
PCI Slots 7-8	PCI 33 PCI 66 PCI-X 66 PCI-X 100	Displays the clock speed and setting of PCI Segment C.
PCI Slots 9-10	33 MHz 66 MHz	Displays the clock speed and setting of PCI Segment D.
PCI Bus Default	**PCI 33** PCI 66 PCI-X 66 PCI-X 100	If no cards are present behind a PCI-X capable bus, this selects the capabilities of that empty bus. If cards are present, this option is ignored and the slot speed is automatically determined.
PCI Device, Embedded SCSI		Selects *PCI Mode* Submenu for the embedded LVDS controller.
PCI Slot 1		Selects *PCI Mode* Submenu for this PCI slot.
PCI Slot 2		Selects *PCI Mode* Submenu for this PCI slot.
PCI Slot 3		Selects *PCI Mode* Submenu for this PCI slot.
PCI Slot 4		Selects *PCI Mode* Submenu for this PCI slot.

Table 12: PCI configuration options

Menu item	Option	Description
PCI Slot 5		Selects *PCI Mode* Submenu for this PCI slot.
PCI Slot 6		Selects *PCI Mode* Submenu for this PCI slot.
PCI Slot 7		Selects *PCI Mode* Submenu for this PCI slot.
PCI Slot 8		Selects *PCI Mode* Submenu for this PCI slot.
PCI Slot 9		Selects *PCI Mode* Submenu for this PCI slot.
PCI Slot 10		Selects *PCI Mode* Submenu for this PCI slot.

Table 12: PCI configuration options

5.3.4.2 PCI Mode submenu

Menu item	Option	Description
Option ROM scan	Disabled **Enabled**	Enables the *ROM scan* option.
Enable Master	Disabled **Enabled**	Enables the LVDS controller as the PCI bus master.
Latency Timer	Default 0020h 0040h 0060h **0080h** 00A0h 00C0h 00E0h	Specifies the minimum number of PCI bus clocks that the controller can master on a PCI bus during one transaction.

Table 13: PCI mode options

5.3.4.3 I/O Device Configuration submenu

Menu item	Option	Description
Serial Port A		Configures serial port A using options:
	Disabled	No configuration
	Enabled	User configuration
	Auto	BIOS or the operating system chooses configuration.
Base I/O Address	**3F8** 2F8 3E8 2E8	Sets the I/O address for serial port A:
Interrupt	IRQ3 **IRQ4**	Sets the IRQ for serial port A.
Serial Port B		Configures serial port B using options:
	Disabled	No configuration
	Enabled	User configuration
	Auto	BIOS or the operating system chooses configuration.
Base I/O Address	3F8 **2F8** 3E8 2E8	Sets the I/O address for serial port B.
Interrupt	**IRQ3** IRQ4	Sets the IRQ for serial port B.
Parallel Port		Configures the parallel port:
	Disabled	No configuration
	Enabled	User configuration
	Auto	Configuration is determined by BIOS or operating system.
Mode	Output only **Bidirectional** EPP ECP	Selects the mode for the parallel port.

Table 14: I/O configuration options

Menu item	Option	Description
Base I/O Address	**378h** 278h 178h 3BCh	Sets the I/O address for the parallel port (178 can only be set in EPP mode. Otherwise, 3BCh is available).
Interrupt	IRQ5 **IRQ7**	Sets the IRQ for the parallel port.
DMA channel	DMA 1 **DMA 3**	Selects the DMA channel for LPT port when configured for ECP mode.
Floppy Disk Controller		Configure the floppy disk drive controller:
	Disabled	No configuration
	Enabled	User configuration
	Auto	Configuration is determined by BIOS or operating system.

Table 14: I/O configuration options (continued)

5.3.4.4 Advanced Chipset Control submenu

Menu item	Option	Description
Extended RAM Step	**1 MB** 1 KB Every location	Selects the thoroughness of the memory test of the extended memory. BIOS defaults to the fastest test.
L2 Cache	Disabled	Disables the secondary cache for core clock frequency/bus ratios equal to 2.
	Enabled	Causes the secondary cache to be sized and enabled.
Multiboot Support	**Disabled** Enabled	Only set this option if the total number of bootable drives is fewer than eight.
Override PHP Switches	**Disabled** Enabled	If set on disabled, only the PCI slots with activated switch will be take into consideration.
2 GB Memory Limit	**Disabled** Enabled	If enabled, the BIOS limits the top of memory to 2 GB. Additional memory becomes inaccessible.

Table 15: Advanced Chipset Control options

5.3.5 Security Menu

Menu item	Option	Description
User password is	Set **Clear**	When you enter your user password, this option automatically changes to *Set*.
Administrator password is	Set **Clear**	When you enter an administrator password, this option automatically changes to *Set*.
Set user password	Press Enter	The user password controls the boot process (to enter a password, press ↵ and follow the screen prompts).
Set administrative password	Press Enter	Access to the Setup utility is controlled via the administrator password (to enter a password, press ↵ and follow the screen prompts).
Password on boot	**Disabled** Enabled	Requires entry of a password before boot (the system remains in secure mode until you enter the password; Password on Boot takes precedence over Secure Mode Boot).
Secure Mode Timer	**Disabled** 1 min. 2 min. 5 min. 10 min. 20 min. 1 hr. 2 hr.	Specifies the time-out period of keyboard or mouse inactivity before the secure mode is activated (you must enter a password in order to work in secure mode).
Secure Mode Hot Key (Ctrl + Alt +?)	**Disabled** **[A, B,...,Z]**	Selects a hot key (pressing Ctrl + Alt +your hot key places the system in secure mode).
	CAUTION! The key combination must not conflict with the key combinations in any application.	

Table 16: Security options

Menu item	Option	Description
Secure Mode Boot	**Disabled** Enabled	Starts the system in secure mode (the system is released by entering a password).
Video Blanking	**Disabled** Enabled	Blanks the screen when secure mode is enabled (the system is released by entering a password).
Floppy Write Protect	**Disabled** Enabled	Write-protects the floppy disk drive when secure mode is enabled (deactivate the write-protect option by entering a password).
Front Panel lockout	**Disabled** Enabled	Disable front panel when secure mode activates. Requires password to inlock system.

Table 16: Security options (continued)

5.3.6 Server Menu

Menu item	Option	Description
System Management		*Selects the System Management* submenu to change the server management features.
Console Redirection		*Selects the Console Redirection* submenu.
Processor Retest	**No** Yes	Clears the previous processor status from BIOS and retests all the processors the next time the system boots.
EMP Password Switch	**Disabled** Enabled	Activates the EMP password.
EMP Password		Selects the EMP password.
EMP ESC Sequence		Updated by the FPC firmware.
EMP Hang-up Line String		
Modem Init String		
High Modem Init String		
EMP Access Mode	Preboot Only	EMP is enabled during power down or POST.
	Always Active	EMP is always enabled.
	Disabled	EMP is disabled.
EMP Restricted Mode Access	**Disabled** Enabled	Disables power down, front panel NMI and reset control via EMP. Restricted mode can be selected with *Preboot* or *Always Active*.
EMP Direct Connect/ Modem Mode	**Direct Connect** Modem Mode	Selects direct connection to the port or connection via a modem.

Table 17: Server Menu options

5.3.6.1 System Management submenu

Menu item	Option	Description
Firmware SMIs	Disabled **Enabled**	Disables all firmware SMI sources.
System Event Logging	Disabled **Enabled**	Logs critical system events.
Clear Event Log	**Disabled** Enabled	Deletes the system event log.
Memory Scrubbing	**Disabled**	The chipset will deliver corrected data but will not update the memory contents.
	Enabled	The chipset will correct the memory contents when a correctable error is detected.
AERR Enable	**Enable**	The host bus Address Parity Error signal (AERR) is enabled for each processor that supports it.
	Disable	AERR is ignored.
Assert NMI on BERR	Disabled **Enabled**	Generates an NMI (the *Firmware SMIs* option must be enabled to assert an NMI).
Assert NMI on PERR	Disabled **Enabled**	Generates an NMI (the *SERR* option is required).
Assert NMI on SERR	Disabled **Enabled**	Generates an NMI.
Enable Host Bus Error	Disabled **Enabled**	Allows host single- and multiple-bit errors.
FPC Error Check	**Disabled** Enabled	If enabled, BIOS verifies that it can communicate with the Front Panel Controller (FPC).
HSC Error Check	**Disabled** Enabled	If enabled, BIOS verifies that it can communicate with the Hot Swap Controller (HSC).
Server Management Information		Selects the *System Management Information* submenu.

Table 18: Server Management options

5.3.6.2 Server Management Information submenu

This submenu displays the system serial numbers, system part number, and server management controller revisions. No changes can be made in this menu in user mode. If you want to make changes, please consult your system administrator.

Menu item	**Description**
Board Part Number	For information only
Board Serial Number	For information only
System Part Number	For information only
System Serial Number	For information only
Chassis Part Number	For information only
Chassis Serial Number	For information only
BMC Revision	For information only
FPC Revision	For information only
HSC Revision	For information only

Table 19: Server Management information

5.3.6.3 Console Redirection submenu

Menu item	**Option**	**Description**
COM Port Address	**Disabled** 3F8 2F8 3E8	Selects the address of the serial port. Make sure that these values are identical to those of serial ports A and B in the *I/O Device Configuration* submenu.
IRQ #	**3** or 4	When enabled, the displayed IRQ is used.
COM Port Baud Rate	**9600** 19 200 K 38 400 K 115 200 K	Selects the transfer rate in bits/s.
Flow Control		Selects data flow control.
	No Flow Control	No flow control.
	CTS/RTS	Controlled by the hardware.
	XON/XOFF	Controlled by the software.
	CTS/RTS+CD	Controlled by the hardware with carrier detect for modem use.

Table 20: Console Redirection options

5.3.7 Boot Menu

Menu item	Option	Description
Floppy Check	Disabled	Accelerates the boot process.
	Enabled	Checks the floppy disk drive type on boot.
Boot Device Priority	1. Removable Devices	Selects the search order for the types of boot devices. The operating system assigns drive letters to the devices in the order shown. Use the ↑ and ↓ arrows to select a device. Press + or - to move the device up or down in the list to change the sequence (press Esc to exit this menu).
	2. Hard Drive	
	3. ATAPI CD-ROM Drive	
Removable Devices	1. Legacy Floppy Devices	Use the ↑ and ↓ arrows to select a device. Press + or - to move the device up or down in the list to change the sequence (press Esc to exit this menu).
Hard Drive	Bootable Ad-In Card	The system attempts to boot the operating system from the first disk drive on the list. If it does not find an operating system, the system tries the next drive on the list until it finds an operating system. Use the ↑ and ↓ arrows to select a device. Press + or - to move the device up or down in the list (press Esc to exit this menu).
Maximum Number of I_2O Drives	**1** 4	Selects the maximum number of I_2O drives that will be assigned to a DOS drive letter.
Message Time-out Multiplier	**1**, 2, 4, 8, 10, 50, 100, 1000	All time-out values will be multiplied by this number.

Table 21: Boot Menu options

Menu item	Option	Description
Pause During POST	**Disabled** Enabled	Starts IRTOS manually. When you hear three beeps, POST has stopped (press any key to continue).

Table 21: Boot Menu options (continued)

5.3.8 Exit Menu

The following menu items are available on the *Server* menu. Select an item using the up and down arrows. Press ↵ to select this option and follow the instructions.

Menu item	Description
Exit Saving Changes	Exits Setup and saves the changes in CMOS-RAM.
Exit Discarding Changes	Exits Setup without saving the changes to CMOS-RAM.
Load Setup Defaults	Loads the Setup default values.
Load Custom Defaults	Loads the user-defined default values.
Save Custom Defaults	Saves changes to the user-defined default values (normally, PhoenixBios reads the Setup settings from CMOS-RAM. However, if CMOS-RAM fails, BIOS uses user-defined values if such values have been specified. If not, BIOS uses the factory defaults).
Discard Changes	Discards the changes and loads the previous settings from CMOS-RAM.
Save Changes	Saves the changes to CMOS-RAM.

Table 22: Exit Menu items

5.4 Utilities

5.4.1 System Setup Utility (SSU)

The *System Setup Utility* (SSU) is used for configuring the system under operating systems such as, for example, *Open Server*, *Netware*, *Unixware 7.1.0*. These operating systems are not “shared interrupt“-capable and the resources must be assigned clearly to the PCI slots /PCI add-on boards. The parameters set with the SSU take precedence over the *BIOS Setup* settings.

The *System Setup Utility* is on the *ServerStart* CD shipped with the server.

The program is a compressed archive that must be extracted to three floppy disks. These floppy disks are then loadable.

Refer to the README.TXT file for further information on using and operating the SSU.

The program provides a graphical user interface (GUI) that has been extended for server configuration and which supports the following functions:

- Assignment of resources (ports, memory, IRQs, DMA) to devices and add-on boards before loading the operating system.
- Specification of boot sequence and system security options.
- Troubleshooting if operating system is not operational.
- System-level view of the I/O devices.
- Modifying, saving and restoring the server configuration.

The SSU is PCI-aware and supports compatible configuration files (.cfg) supplied by the manufacturer of the peripheral devices.

5.4.2 BIOS update

5.4.2.1 Preparations

Before you update BIOS, record the current BIOS settings, obtain the utility, and make a copy of the current BIOS.

Recording the current BIOS settings

- Start the server and press F2 when the following message is displayed on the screen:

  ```
  Press <F2> key if you want to run SETUP
  ```

- Write down the current settings from the *BIOS Setup* program.

  Do not skip set 2. You will need these settings to configure your computer at the end of the procedure.

Creating bootable floppy disks

- Use a DOS or Windows 95 system to create the floppy disk.
- Insert the disk in drive A.
- At the C:\ prompt, enter the following for an unformated floppy disk:

  ```
  format a:/s
  ```

  or the following for a formated floppy disk:

  ```
  sys a:
  ```

- Press ↵.
- Copy the flash files generated as described in section “BIOS and firmware update” on page 70 to your bootable floppy disks.

5.4.2.2 BIOS and firmware update

You find the Software for the BIOS and firmware update on the Fujitsu-Siemens Computers-PC Software Pool:

BMC	BaseBoard Management Controller
FRU/SDR	FRU- and Sensor data
FPC	Front Panel Controller
BIOS with User Binaries	System BIOS and FSC User Binaries
HSC	FSC P-Bay with two Hot-Swap Controller

Before You start an update pay attention to the notes attached to the corresponding BIOS and firmware version.

For generate flash floppy disks the software must be downloaded by using the utility *Flash-BIOS-Download*.

For updating observe the given flash sequence:

Example:

1. BMC V.26

   Not necessity of user entries.

2. FRU/SDR V1.01

   ► Select

   `<<Load the SDR from file>>`

   and eventually the installed CPU frequency with

   `<<600 MHz and above>>`

3. FPC V.18

   Not necessity of user entries.

4. BIOS V.20 with User Binaries V1.03

   The prompt appears often:

   `<<CR>>`

   ► Confirm each time with Return ↵.

5. HSC V.6

   Not necessity of user entries.

5.4.2.3 Recovering BIOS

Although it is unlikely that the BIOS update process will be interrupted, BIOS could be damaged if an interruption does occur. In this case, you must recover BIOS.

Because of the small amount of code available in the non-erasable boot block, there is no graphics support. Therefore, you will not see anything on the screen during this procedure. You can monitor the procedure by listening to the beeps and looking at the LED on the floppy disk drive.

The procedure for recovering BIOS is described in detail in the section “Changing the switch settings” on page 39. After completing the procedure, leave the update disk in drive A and turn on the server. Then continue with the procedure for updating BIOS.

5.4.2.4 Changing the BIOS language

You can use the BIOS update utility to change the language used for BIOS display. Use a bootable floppy disk containing the flash utility and language files.

- Boot the server with the bootable floppy disk in drive A. The user interface for the BIOS update utility is displayed on the screen.
- Select *Update Flash Memory From a File* and then *Update Language Set*. Then press ↵.
- Use the arrow keys to select the appropriate lng file. Press ↵.
- When asked to confirm that you want to overwrite the old language in memory with the new language, select *Continue with Programming* and press ↵.
- When the message *Upgrade is Complete* is displayed, remove the floppy disk from drive A and press ↵.

  The computer will reboot and the changes will take effect.

5.4.3 Installing graphic drivers

After configuration the system, you must install graphic drivers in order to fully utilize the functions of the onboard CL-GD5480 super VGA graphic controller.

- ► The CD-ROM containing the configuration software also contains the graphic drivers for use under DOS or Windows NT. Read the information on installing these drivers in the *README.TXT* file on the CD-ROM.
- ► You will find information on other operating systems in your operating system instructions for installing device drivers.

5.4.4 QLogic SCSI utility

The QLogic SCSI utility detects the SCSI host adapter on the system board. You can use this utility to

– change default values

– check and/or change SCSI device settings that may conflict with those of other servers.

Running the SCSI utility

► To start the program, press Alt + Q when the following message is displayed on the screen:

```
Press Alt+Q to start QLogic Configuration Utility ...
```

5.4.5 Installing PCI hot-plug software

The PCI hot-plug software *PCI Hot Plug setup* is included on the ServerStart CD (see also the section “Boards in hot-plug PCI slot” on page 99).

► Place the CD in the CD drive and start the *setup.exe* program.

The setup program copies the PCI hot-plug utility and the corresponding drivers to the hard disk and makes the necessary registry entries. A new symbol is added to the Control Panel which you can use to run the PCI hot-plug utility.

6 Property and data protection

The lockable rack door protects the server against unauthorized access.

You can protect your system and your data internally against unauthorized access using the *BIOS Setup* security functions (see also the section “BIOS Setup” on page 47):

– Set the administrator and user passwords.

– Set secure mode to prevent keyboard or mouse input and prevent use of the operating controls.

Password protection

BIOS passwords prevent tampering with the server. If you set the user password but not the administration password, BIOS ask you to enter the user password before you can boot the server. If, however, you set both passwords, you can start the server or enable the keyboard and mouse once you have entered either password. You can only change the server configuration with *BIOS Setup* if you have entered the administration password.

Secure boot mode

Secure boot mode allows you to boot the server and run the operating system. However, you cannot use the keyboard or the mouse until you enter the user password.

You can use *BIOS Setup* to put the server in secure boot mode. If BIOS detects a CD-ROM in the CD-ROM drive or a floppy disk in drive A, you are prompted to enter a password. Once you have entered the password, the server is booted from the CD-ROM in the CD-ROM drive or the floppy disk in drive A. Entering a password also disables secure mode.

If there is no CD-ROM or floppy disk in one of the drives, the server boots from drive C and automatically goes into secure mode. All enabled secure mode settings go into effect when the server is booted. If you set a hot-key combination, you can secure the server immediately.

Boot sequence control

The BIOS security functions determine the boot devices and the boot sequence. They also control the write function for the floppy disk drive in secure mode. The normal boot sequence starts with the floppy disk drive, followed by the hard disk drive, the CD-ROM drive and the network.

Boot without keyboard

The server can boot with or without the keyboard. Before it boots, during POST, BIOS automatically detects and tests the keyboard if one is present.

Locking the power and reset buttons

The power and reset buttons on the front panel are locked when the server is in secure mode. To terminate secure mode, enter your user password.

Floppy disk write protection

If floppy disk write protection is enabled in *BIOS Setup*, the floppy disk drive is only protected while the server is in secure mode.

Blanking the screen

If screen blanking is enabled in *BIOS Setup*, nothing is displayed on the screen when the server is in secure mode. Entering your user password terminates secure mode.

If the administrator sets the Password Clear switch on the I/O board to the clear position (ON), BIOS clears the administrator and user passwords (see the section “Changing the switch settings” on page 39). BIOS also attempts to clear the EMP password. If the FPC is not present or not fully functional, BIOS continues after a time out.

7 Troubleshooting and tips

CAUTION!

Observe the safety information in the manual “Safety, Warranty and Ergonomics” and in the chapter “Installing the server” on page 19 and the chapter “System expansions” when connecting or disconnecting cables.

If a fault occurs, try to correct it as described

– in this chapter,
– in the documentation for the connected devices,
– in the help system of the individual programs.

If you fail to correct the problem, proceed as follows:

► Make a note of the steps and the circumstances that led to the fault. Also make a note of any error messages displayed.

► Switch off the server.

► Contact your customer service.

7.1 Power-on indicator remains dark

The power-on indicator remains dark after you have switched on your device:

Power cable incorrectly connected

► Make sure that the power cable is correctly connected to the server and to the grounded insulated socket.

Power supply overloaded

► Pull the power plug of the server out of the insulated socket.

► Wait a few seconds and plug the power plug into the insulated socket again.

► Switch on your server.

7.2 Server switches itself off

Server management has detected an error

► In the *ServerView* program, check the error list or the Error Log file with the *SCU utility* and attempt to eliminate the error.

7.3 Screen remains dark

Monitor is switched off

► Switch on your monitor.

Screen has been blanked

► Press any key on the keyboard.

or

► Deactivate screen blanking (screen saver). Enter the appropriate password.

Brightness control is set to dark

► Set the brightness control to light. For detailed information, please refer to the operating manual supplied with your monitor.

Power cable or monitor cable not connected

► Switch off the monitor and the server.

► Check whether the power cable is properly connected to the monitor and to the grounded insulated socket.

► Check whether the monitor cable is properly connected to the server and monitor (if it is plugged in with a connector). If a separate graphics card is installed in the server, the monitor cable must be connected to the port of this graphic card.

► Switch on the monitor and the server.

7.4 Flickering stripes on the monitor screen

CAUTION!

Switch the server off immediately.

Monitor does not support the set horizontal frequency

- ► Find out which horizontal frequency your monitor screen supports. You will find the horizontal frequency (also known as the line frequency or horizontal deflection frequency) in the documentation for your monitor.
- ► Refer to the documentation for your operating system or the software for your screen controller for how to set the correct horizontal frequency for your monitor and follow the procedure accordingly.

7.5 No screen display or display drifts

The wrong horizontal frequency or resolution has been selected for the monitor or for the application program.

- ► Find out which horizontal frequency your monitor supports. You will find the horizontal frequency (also known as line frequency or horizontal deflection frequency) in the documentation for your monitor.
- ► Refer to the documentation for your operating system or the software for your screen controller for how to set the correct horizontal frequency for your monitor and follow the procedure accordingly.

7.6 No mouse pointer displayed on the screen

Mouse driver not loaded

- ► Check whether the mouse driver is properly installed and is activated. Information on the mouse driver can be found in the documentation for the mouse, the operating system or the application program.

7.7 Floppy disk cannot be read/written

- ► Check whether the write protection of the floppy disk is activated.
- ► Check the entry for the floppy disk drive in BIOS Setup.
- ► Check BIOS Setup to see whether the floppy disk drive controller and write permission are enabled.

7.8 Time and date are not correct

- ► Set the time and/or date in the operating system or in BIOS Setup.

i If the time and date are repeatedly wrong when you switch on your server, you must change the lithium battery. Please contact our service department.

7.9 System will not boot

The system will not boot after installing a new hard disk drive.

SCSI configuration incorrect (Ultra Wide SCSI controller)

- ► In the SCSI configuration menu, check the settings for the hard disk drives (SCSI Device Configuration) and the settings under Advanced Configuration Options.

7.10 Drives are reported as “dead”

This error message may occur when the server has a disk array controller.

SCSI cabling incorrect

► Make sure that the SCSI cabling and the SCSI channel assignment still correspond to the original state.

The configuration of the disk array controller is incorrect

► Check and correct the settings for the drives with the DAC utility DACCF or EzAssist.

Refer to the documentation for the disk array controller for further information.

7.11 Added drive reported defective

This error message may occur when the server has a disk array controller.

Disk array controller is not configured for this hard disk drive

The drive was probably installed with the system switched off.

► Reconfigure the disk array controller for the hard disk drive with the DAC utility DACCF or EzAssist. Refer to the documentation for the disk array controller for further information.

or

► Reinstall the drive while the system is up and running.

If the hard disk drive continues to be shown as defective, replace it (see section “Replacing SCSI hard disk drives” on page 91).

7.12 Error messages on the screen

The meaning of the error messages is contained in the manual on BIOS Setup and in the documentation on the boards and programs used.

7.13 Error messages on the LCD display

Parallel to the LED error messages on the control panel (see the section “Control panel” on page 33), appropriate POST Error Codes are output on the LCD display field during the POST process:

Code	Error message
0200	Failure fixed disk
0210	Stuck key
0211	Keyboard error
0213	Keyboard locked - unlock key switch
0220	Monitor type does not match CMOS: run *BIOS Setup*
0230	System RAM failed at offset
0231	Shadow RAM failed at offset
0232	Extended RAM failed at offset
0250	System battery is dead: replace and run *BIOS Setup*
0251	System CMOS checksum bad/Default configuration used
0260	System timer error
0270	Real time clock error
0280	Previous boot incomplete/Default configuration used
0281	Memory size found by POST differed from EISA CMOS
0297	Extended memory error
02B0	Diskette drive A error
02B1	Diskette drive B error
02B2	Incorrect drive A type: run *BIOS Setup*
02B3	Incorrect drive B type: run *BIOS Setup*
02D0	System cache error/Cache disabled
02F0	CPU ID
02F4	EISA CMOS not writable
02F5	DMA test failed
02F6	Software NMI failed

Table 23: POST error codes and messages

Code	Error message
02F7	Fail-safe timer NMI failed
8108	Watchdog timer failed on last boot
8110	Server management interface failed to function
814B	BMC in update mode
8150	NVRAM cleared by jumper
8152	ESCD data cleared
8153	Password cleared by jumper
8160	Unable to apply BIOS update for right processor 1
8161	Unable to apply BIOS update for right processor 2
8162	Unable to apply BIOS update for right processor 3
8163	Unable to apply BIOS update for right processor 4
8164	Unable to apply BIOS update for left processor 1
8165	Unable to apply BIOS update for left processor 2
8166	Unable to apply BIOS update for left processor 3
8167	Unable to apply BIOS update for left processor 4
8168	Right processor 1 L2 cache failed
8169	Right processor 2 L2 cache failed
816A	Right processor 3 L2 cache failed
816B	Right processor 4 L2 cache failed
816C	Left processor 1 L2 cache failed
816D	Left processor 2 L2 cache failed
816E	Left processor 3 L2 cache failed
816F	Left processor 4 L2 cache failed
8170	BIOS does not support current stepping for right processor 1
8171	BIOS does not support current stepping for right processor 2
8172	BIOS does not support current stepping for right processor 3
8173	BIOS does not support current stepping for right processor 4
8174	BIOS does not support current stepping for left processor 1

Table 23: POST error codes and messages

Code	Error message
8175	BIOS does not support current stepping for left processor 2
8176	BIOS does not support current stepping for left processor 3
8177	BIOS does not support current stepping for left processor 4
8180	PXB 1 failed to respond
8181	Mismatch among processors detected
8182	L2 cache size mismatch
8200	Baseboard management controller failed to function
8201	Front panel controller failed to function
8202	Power share controller failed to function
8203	Hot-plug controller failed to function
8210	Right processor 1 failed BIST
8211	Right processor 2 failed BIST
8212	Right processor 3 failed BIST
8213	Right processor 4 failed BIST
8214	Left processor 1 failed BIST
8215	Left processor 2 failed BIST
8216	Left processor 3 failed BIST
8217	Left processor 4 failed BIST
8220	Right processor 1 internal (IERR) failure
8221	Right processor 2 internal (IERR) failure
8222	Right processor 3 internal (IERR) failure
8223	Right processor 4 internal (IERR) failure
8224	Left processor 1 internal (IERR) failure
8225	Left processor 2 internal (IERR) failure
8226	Left processor 3 internal (IERR) failure
8227	Left processor 4 internal (IERR) failure
8230	Right processor 1 thermal trip failure
8231	Right processor 2 thermal trip failure

Table 23: POST error codes and messages

Code	Error message
8232	Right processor 3 thermal trip failure
8233	Right processor 4 thermal trip failure
8234	Left processor 1 thermal trip failure
8235	Left processor 2 thermal trip failure
8236	Left processor 3 thermal trip failure
8237	Left processor 4 thermal trip failure
8240	Right processor 1 disabled
8241	Right processor 2 disabled
8242	Right processor 3 disabled
8243	Right processor 4 disabled
8244	Left processor 1 disabled
8245	Left processor 2 disabled
8246	Left processor 3 disabled
8247	Left processor 4 disabled
8250	Right processor 1 failed FRB level 3 timer
8251	Right processor 2 failed FRB level 3 timer
8252	Right processor 3 failed FRB level 3 timer
8253	Right processor 4 failed FRB level 3 timer
8254	Left processor 1 failed FRB level 3 timer
8255	Left processor 2 failed FRB level 3 timer
8256	Left processor 3 failed FRB level 3 timer
8257	Left processor 4 failed FRB level 3 timer
8260	Right processor 1 failed initialization
8261	Right processor 2 failed initialization
8262	Right processor 3 failed initialization
8263	Right processor 4 failed initialization
8264	Left processor 1 failed initialization
8265	Left processor 2 failed initialization

Table 23: POST error codes and messages

Code	Error message
8266	Left processor 3 failed initialization
8267	Left processor 4 failed initialization
8270	Memory module 1 failed
8271	Memory module 2 failed
8280	Coherency filter failed left data test
8281	Coherency filter failed right data test
8290	Coherency filter failed left address test
8291	Coherency filter failed right address test

Table 23: POST error codes and messages

8 System expansions

CAUTION!

Observe the safety information in the chapter “Important notes” on page 11.

This chapter describes how to modify your server hardware (e. g. installing or removing boards or drives).

► If you do not wish to carry out hot-plug operations, then shut down the operating system; switch the server off and pull the power plugs out of the power outlet.

8.1 Opening/closing the server

8.1.1 Removing the front bezel

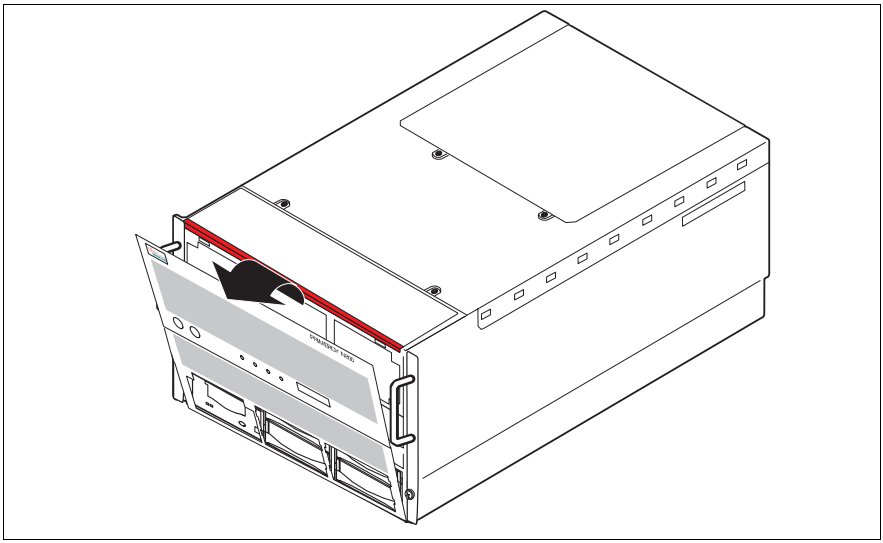

Figure 15: Removing the front bezel

► Pull the front bezel in the direction of the arrow and remove it at an angle.

8.1.2 Mounting the front bezel

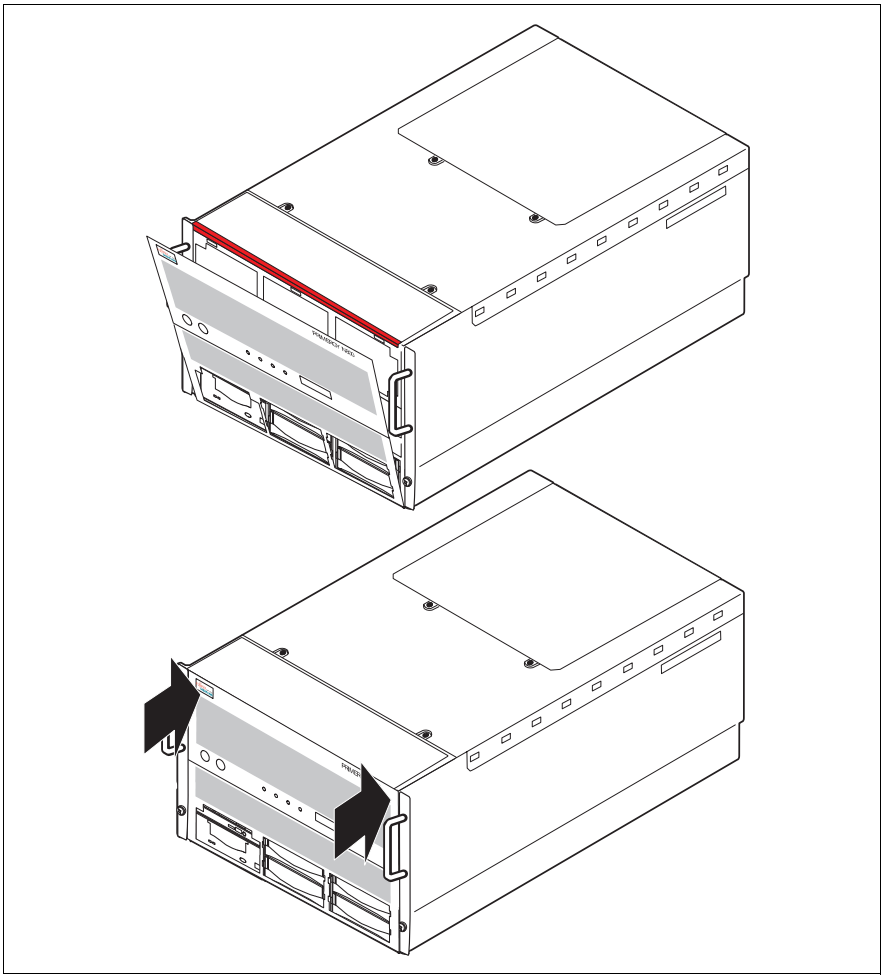

Figure 16: Mounting the front bezel

- Place the front bezel at an angle on the metal clips and push it on the top edges to the chassis in the direction of the arrow until the snaps engage.

CAUTION!

If you open the server during operation make sure that you do not press the power or reset button on the front panel inadvertently.

8.1.3 Removing/mounting the PCI bus hot-plug cover

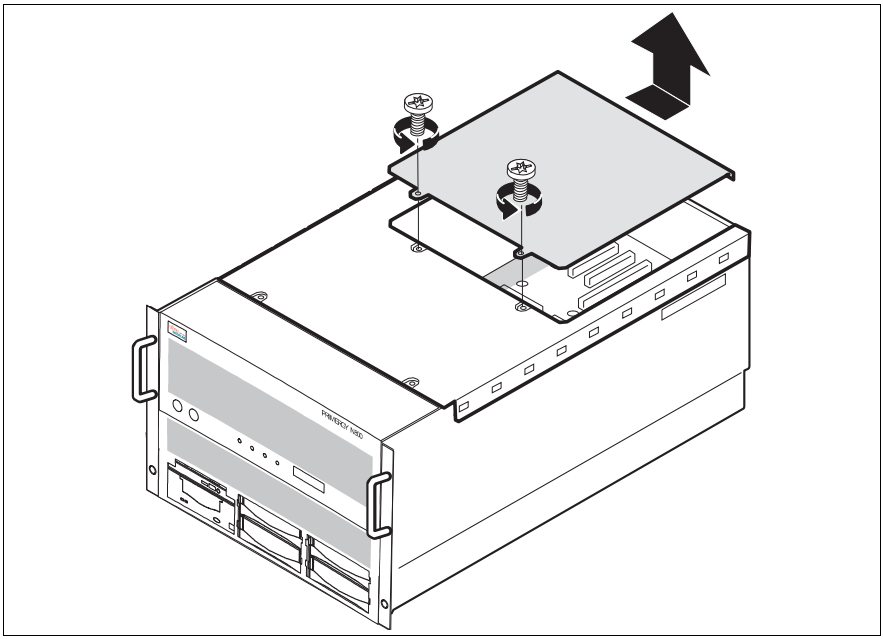

Figure 17: Removing the PCI bus hot-plug cover

- ► Remove the two holding screws.
- ► Push the cover uniformly ca. 2.5 cm in the direction of the arrow to disengage the tabs along the front of the cover from the top cover and remove it.

Mounting is performed in reverse order.

8.1.4 Removing/mounting the top cover

It is not necessary to remove the PCI bus hot-plug cover.

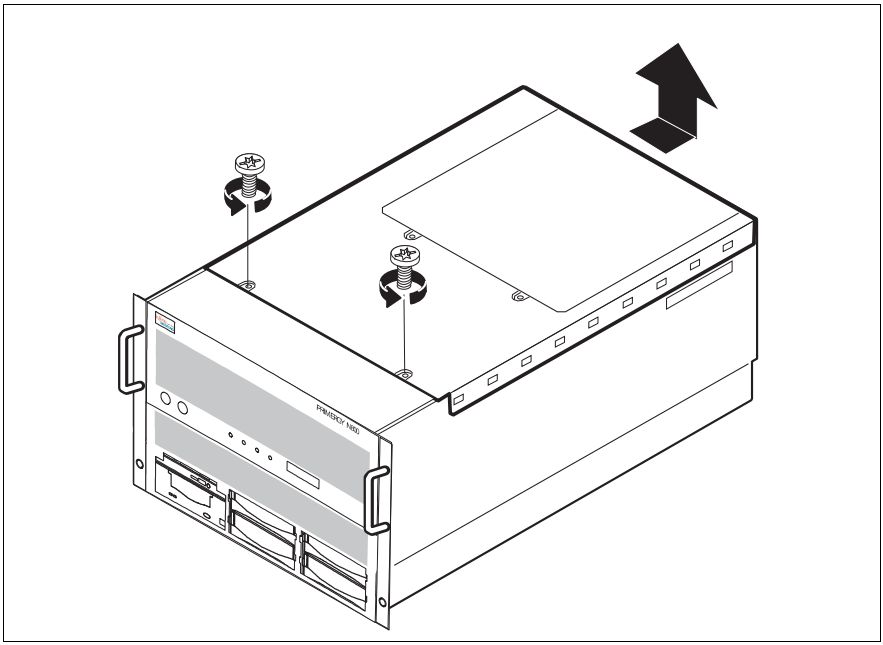

Figure 18: Removing the top cover

- ► Turn off all peripheral devices connected to the server.
- ► Shut the server down, turn the server off and disconnect it from the line voltage.

  CAUTION!

  Turning off the server does not disconnect it from the line voltage. In order to fully disconnect from the line voltage, you must pull out the power plug.

- ► Remove the two holding screws.
- ► Push the cover uniformly ca. 2.5 cm in the direction of the arrow to disengage the row of tabs attaching the cover to the chassis and remove it.

Mounting is performed in reverse order.

8.2 SCSI hard disk drives

The server is equipped with four ultra 3-wide U160 SCSI hard disk drives. Each of the SCSI hard disk drives are mounted in slide-in modules. The drives are externally accessible at the front side of the server and connect to the SCSI backplane via the SCA (single connector attachment) interface. This allows that the drives can simply be inserted or pulled out (hot-plug). As part of the hot-plug implementation, a drive slide-in module with integrate heat dissipation is required. The drives are mounted in the slide-in module with fasteners and the slide-in module snaps into the chassis with a locking mechanism.

The hard disk drives can be controlled either by the dual onboard SCSI controller (default) or by a RAID controller (add-in board in a PCI slot).

If a SCSI hard disk drive is operated on a RAID controller and belongs to a disk array operated with RAID level 1or 5, a hard disk drive can be swapped during operation (hot-swap). To swap a hard disk, you need a hard disk drive with the same or higher capacity. A rebuild on the new hard disk drive is performed automatically after the swap, provided the RAID controller is correctly configured. Refer to the information in the RAID controller manual.

If the hard disk drives are connected to the onboard-SCSI controller (default), the system must be turned off before exchanging a hard disk drive.

So that the storage capacity of the hard disk drive can be recognized at a glance when the hard disk drive is replaced, several prefabricated stickers with the storage capacities are provided with the server. Each hard disk drive (slide-in module) should bear a sticker indicating its capacity on the front. Should no suitable sticker be available, blank stickers for labeling are also provided. The stickers are color coded for easier identification.

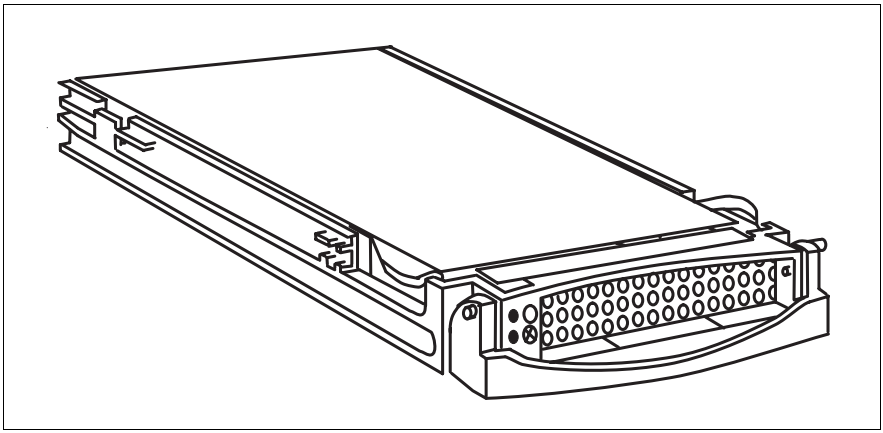

Figure 19: Hot-plug hard disk drive with slide-in module

Two status LEDs monitor the status of each drive.

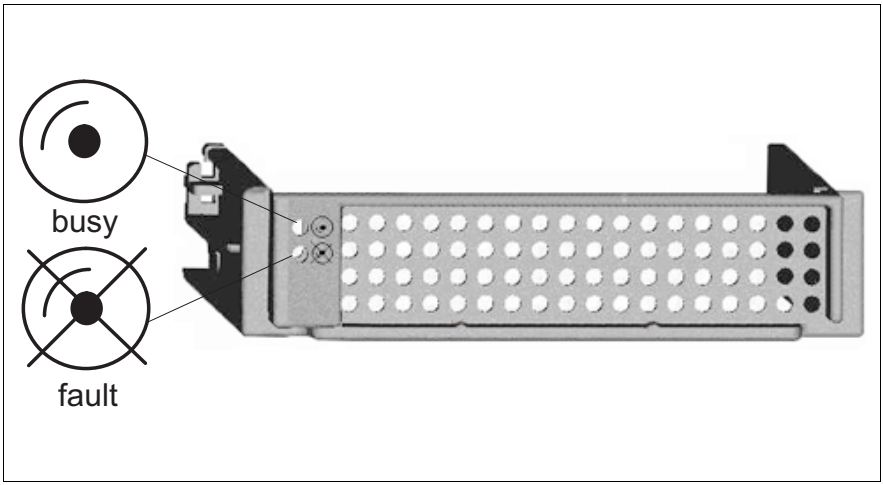

Figure 20: Status indicators for hot-plug disk drives

(busy) Hard disk drive active

(fault) Hard disk drive faulty

LED green	HDD BUSY – lights: drive active – does not light: drive inactive
LED orange	HDD FAULT (in conjunction with a disk array controller) – does not light: No HDD Error – lights: HDD Faulty or Rebuild Stopped (drive defective/needs replacing), a rebuild process was stopped or the slide-in module is not correctly inserted – slow blink: HDD Rebuild (a rebuild is carried out by the DAC after changing a hard disk drive – fast blink: HDD Identify – four fast blinks/pause: HDD Predicted Fault – two fast blinks/pause: HDD Hot Spare (Hot spare drive active. The corresponding drive has failed.

Table 24: SCSI disk drives status control

8.2.1 Replacing SCSI hard disk drives

CAUTION!

Never pull out a hard disk drive during operation if you are not sure that the hard disk drive is operated on a RAID controller and is part of a disk array that operated in the mode RAID Level 1or 5.

A defective drive as part in a disk array has to be replaced during operation only.

The hard disk drives which can be ordered for the server are supplied already mounted in the hard disk drive slide-in modules. A hard disk in the hard disk drive slide-in module can only be replaced by a service technician.

If you want to swap a SCSI hard disk drives during operation, proceed as follows:

If you wish to insert a hard disk drive in an empty bay, then the dummy module must be removed from this bay beforehand.

Installing/removing the dummy module is performed in the same manner of the hard disk drives.

CAUTION!

Keep the dummy module for future use. If the hard disk drive is removed again and not replaced with a new drive, then the dummy module must be reinstalled due to cooling, the applicable EMC regulations (regulations on electromagnetic compatibility) and fire protection.

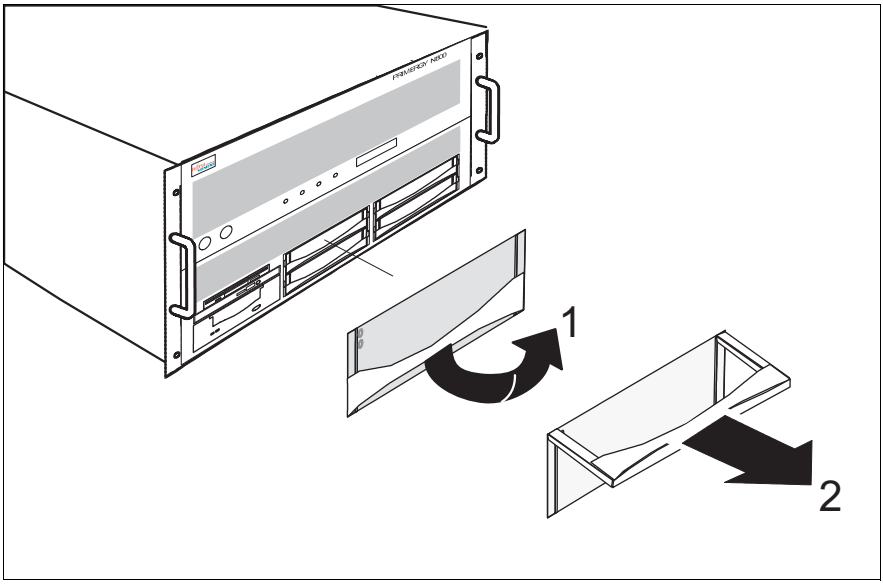

Figure 21: Removing a hard disk drive

- ► Look at the orange LEDs to determine which drive is bad.
- ► Swing up the handle of the hard disk drive slide-in module completely (1) and pull the slide-in module out (2).

Installing occurs in reverse order:

- ► Push the hard disk drive slide-in module into the bay as far as possible and then swing down the handle of the hard disk drive slide-in module completely to enable the locking mechanism to engage.

If you want to swap a SCSI hard disk drives during operation, proceed as follows:

- ► Pull the hard disk drive which is indicated as defective out a few centimeters.
- ► Wait at least 60 seconds. This is necessary so that the RAID controller can detect that a hard disk drive has been pulled out and the hard disk drive has time to stop turning.
- ► Pull the hard disk drive all the way out.
- ► Insert the new hard disk drive.

If a hard disk drive has been removed and no new drive is installed in its place, then install a dummy cover in the empty bay. Make sure that the dummy cover engages properly in the bay.

The SCSI IDs of the hard disk drive slide-in modules are permanently assigned (see also section “Addresses for SCSI devices” on page 117).

The following applies if SCSI hard disk drives are operated on a RAID controller:

- – RAID level 0
  Rebuild is not possible. If a hard disk drive fails, its data is lost.
- – RAID level 1 without standby hard disk drive
  Rebuild on the new disk is carried out automatically when the old disk is swapped.
- – RAID level 1 with standby hard disk drive
  A standby hard disk drive is automatically enabled as a replacement for the defective hard disk drive and the data of the defective disk is rebuilt on the standby disk.
- ► Read the documentation for the new hard disk drive.

8.3 Power supply units

The server are delivered with three power supply units. The power supply units are externally accessible at the rear side of the server (see figure 22 on page 94).

When the yellow power supply failure LED on the front panel turns on, you can determine which power supply unit is defective by checking the three status LEDs of each supply unit (figure 22 on page 94 and/or table 25 on page 95):

1. Power supply unit ready
2. Power supply unit failure
3. The power supply unit is about to fail in the near future because the fan is performing poorly. The power supply unit should be exchanged as soon as possible.

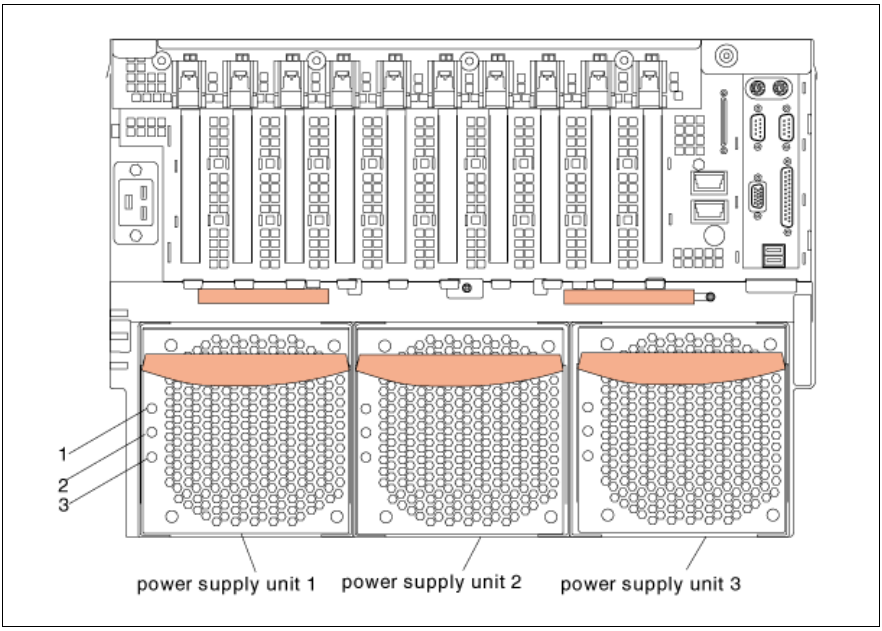

Figure 22: Status indicators for the power supply units

LED green (1)	LED yellow (2)	LED yellow (3)	Description
OFF	OFF	OFF	No AC power.
blinking	OFF	OFF	No AC power; standby outputs on.
ON	OFF	OFF	DC outputs on. Power supply unit okay.
OFF	ON	OFF	Power supply unit failure.
ON	blinking/ none latch	OFF	Current limit.
ON	OFF	blinking/ latched	„Predictive Failure“: The power supply unit is about to fail in the near future because the fan is performing poorly. The power supply unit should be exchanged as soon as possible.

Table 25: Power supply unit status monitoring

8.3.1 Replacing a power supply unit

If a power supply unit fails the yellow power supply failure LED on the front panel turns on. The defective power supply unit can be replaced without turning the server power off.

CAUTION!

Because of chassis airflow disruption, the power supply unit bay should not be vacant and/or not covered for more than five minutes when server power is on. Exceeding the five-minute limit may cause damage to certain drives.

► Look at the yellow LED (2) on the back side of the server (see figure 22 on page 94) to determine which power supply unit is defective.

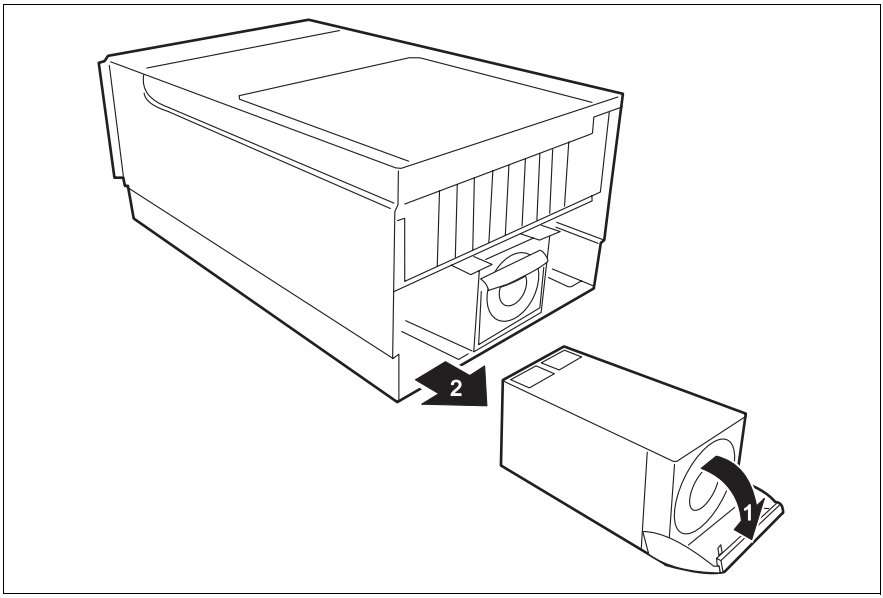

Figure 23: Removing a power supply unit

- ► Pull the power supply unit handle down (1) to unlock it from the chassis.
- ► Pull the power supply unit in the direction of the arrow, out of the bay.

Mounting is performed in reverse order.

8.4 Fans

The system is equipped with six fans. The fans are mounted in the fan array housing placed at the front side of the server and covered by the front bezel.

The fan status can be displayed via the server management software *ServerView*. Additionally, when a fan fails, the yellow fan failure LED on the front panel will be on continuously. Which fan is defective can be determined by checking each yellow LED mounted next to each fan (under the fan housing cover).

i Even though the server can continue operating with only five fans, the defective fan must be replaced in a reasonable amount of time.

Due to the hot-plug architecture, replacement can also take place during operation.

8.4.1 Replacing a fan

► Remove the front bezel (see section “Removing the front bezel” on page 85).

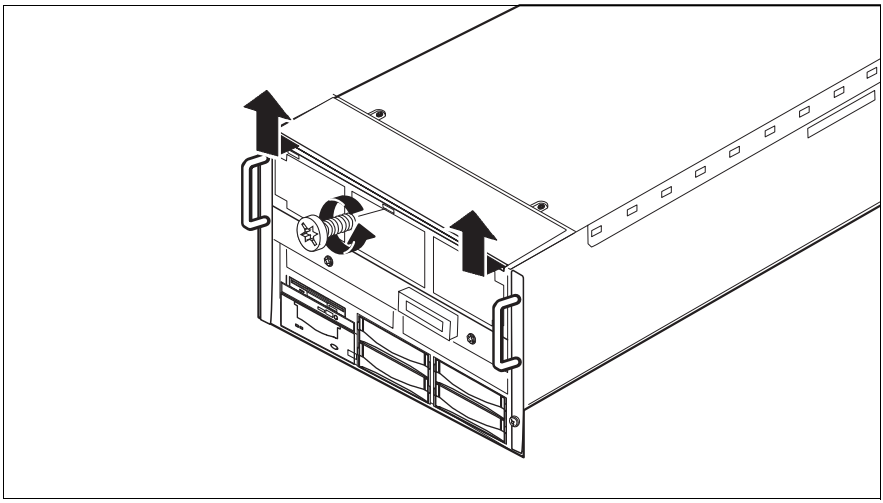

Figure 24: Opening the fan housing cover

► Open the fan housing cover by loosen the screw, slide the cover in the direction of the arrow and lift it. During fan exchange the cover remains tipped.

► Look at the yellow LEDs to determine which fan is defective.

The indicators are placed next each fan. They have the form of an arrow which explains onto the assigned fan.

► Insert your thumb and forefinger into the grasp holes (1) and pull the fan straight up, out of the housing (figure 25 on page 98).

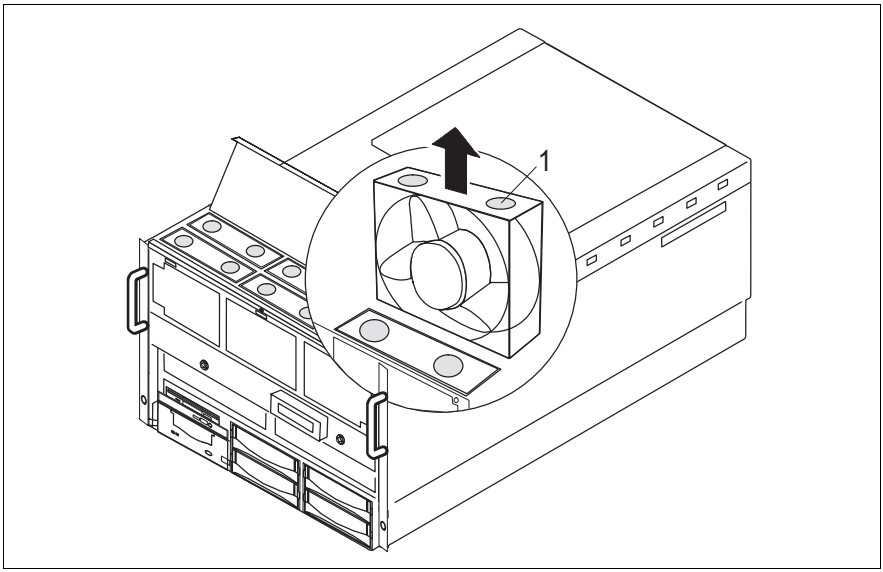

Figure 25: Removing a fan

Mounting is performed in reverse order.

Fans are keyed and can be inserted in only one way.

Be sure that the fan connector mates with the front panel connector when aligning the fan in the fan cavity.

8.5 Boards in hot-plug PCI slot

The server is equipped with ten slots for hot-plug PCI. These hot-plug PCI slots enable installation and removal of boards during operation when the operating system supports this function.

Each hot-plug PCI slot is assigned two pairs of LEDs (hot-plug indicators) which show the current status of the slot. One LED is visible on the back of the server from the outside, the other is located on the inside in the area of the locking clip of the related slot.

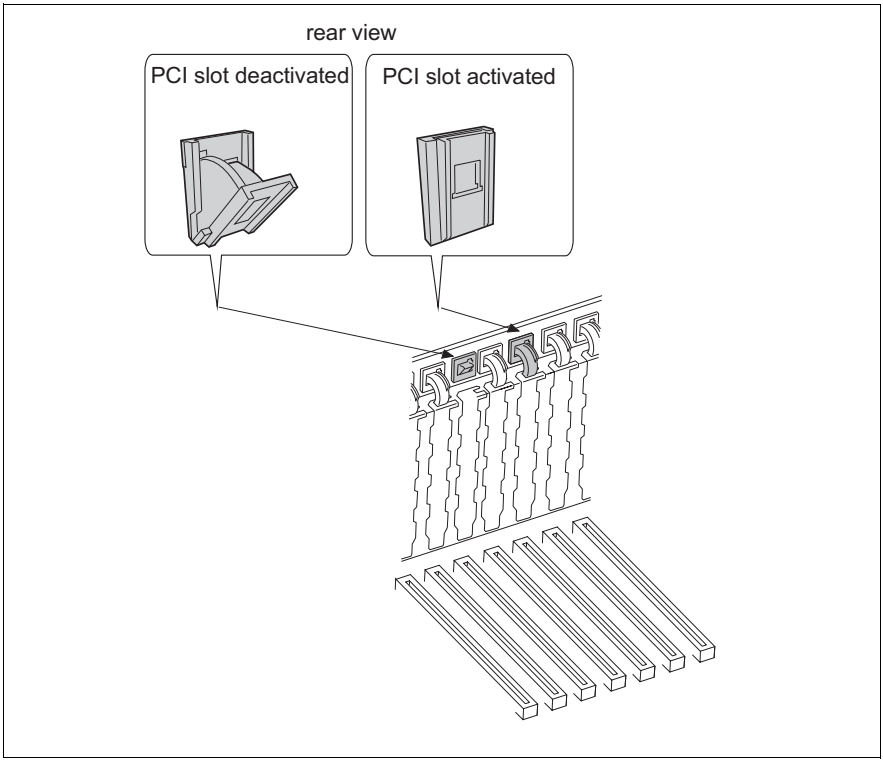

Figure 26: PCI locking mechanism

The PCI hot-plug mechanism is a rotating part that actuates a microswitch.

After the LED shows which slot is powered down, the PCI-board can be removed by pressing on the mechanism actuator and rotating the mechanism (figure 26 on page 99/PCI slot deactivated).

After a new PCI board is installed, the locking mechanism must be rotated back into place to activate the microswitch and secure the board in the slot (figure 26 on page 99/PCI slot activated). If an attempt is made to pull out the related board despite the green LED being lit, the microswitch disconnects the slot from the power supply to protect the board and system from damage.

The hot-plug function is not supported by the operating systems such as Windows NT 4.0, Windows 2000 and SCO UNIX Ware (supported by NetWare 5.0). To nevertheless already make the hot-plug function partially available under Windows NT 4.0 and Windows 2000 PCI hot-plug utility is provided with the server start-CD which enables the necessary function for the swapping of PCI boards of same (hot-swap) type (see section “Installing PCI hot-plug software” on page 72).

LED indicators

The following table shows the possible display modes and their meaning:

Voltage indicator (green)	Warning indicator (yellow)	Status description
OFF	OFF	**Emergency-off status** The PCI slot locking mechanism was loosened without the intervention of the operating system. The slot is powered down and disconnected from the PCI bus.
OFF	ON	**Hot-plug status** There are two different reasons for this status: ● A board is installed in this slot. The board has been powered down and disconnected from the PCI bus. It can be removed from the slot without danger. ● No board is installed in this slot. If a board has been removed under monitoring by the PCI hot-plug utility, then a new board of the same type can be installed.

Table 26: LED status indicators

Voltage indicator (green)	Warning indicator (yellow)	Status description
ON	OFF	**Normal status** The slot is being supplied with power. If a board is installed in this slot, it is operating.
ON	ON	**Warning status** A board is installed in this slot. The board is being supplied with power, however is not operating. The board must be checked.

Table 26: LED status indicators (continued)

8.5.1 Replacing boards in the hot-plug PCI slot

CAUTION!

Observe the safety information in the chapter “Important notes” on page 11).

Do not overload the I/O board by installing addition PCI boards that need a disproportionately large amount of power. Consult your service partner for information regarding the restrictions relating to power consumption that apply to the PCI slots.

Several board connectors exceed the default values for protection class II or the power supply limits. Therefore the appropriate intermediate cables must be used to install the boards according to national electrotechnical guidelines.

PCI boards can be extremely sensitive to electrostatic discharge and must always be handled carefully. After removing the board from its protective wrapper or the server, place it with the component side up on a non-conductive, antistatic surface. Do not slide the board over any surface.

Read the documentation supplied with the board beforehand.

- ► Start the PCI hot-plug utility from the Control Panel.
- ► Select the board you want to swap.
- ► Select the *Remove* function.
- ► Wait until the message *Remove the adapter then click OK* is displayed.

  The power LED (green) must be dark and the warning LED (yellow) must be blinking.
- ► Remove the hot-plug PCI cover (see the section “Removing/mounting the PCI bus hot-plug cover” on page 87).
- ► Remove any cables connected to the board.

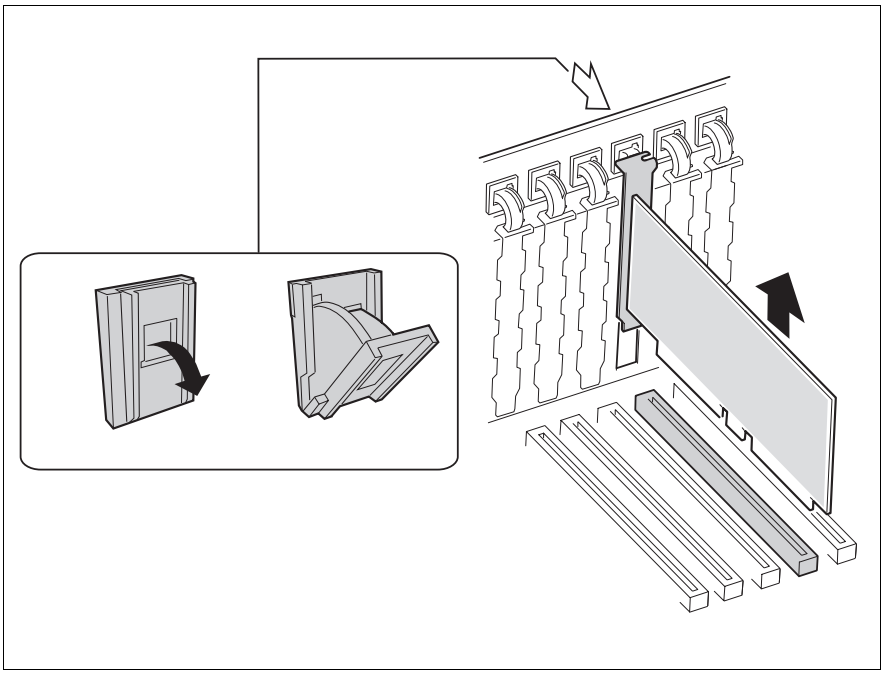

Figure 27: Removing the PCI board

- ► Release the PCI locking mechanism and remove the board.
- ► Confirm the message *Remove the adapter then click OK* with OK.

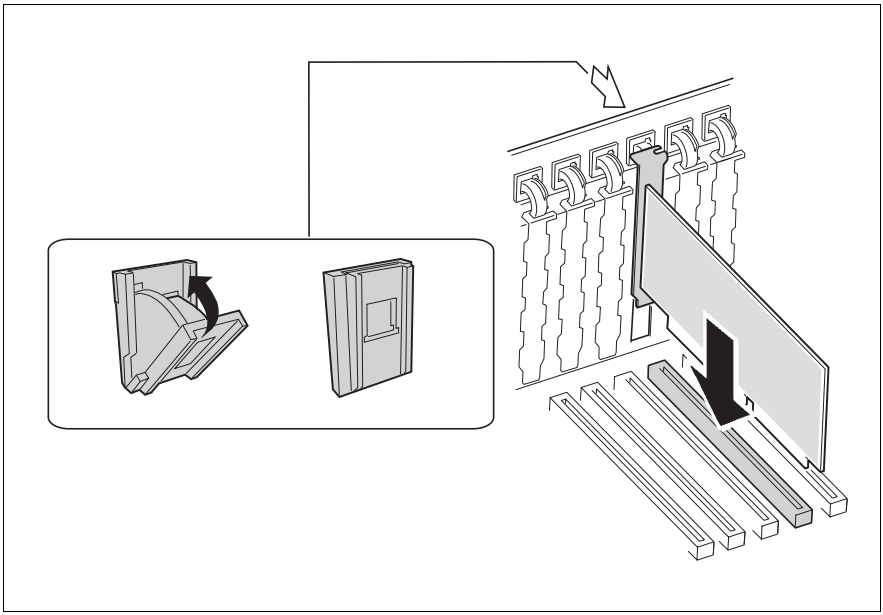

Figure 28: Inserting the PCI board

- ► If necessary, set jumpers and switches on the new board according to the instructions supplied by the manufacturer.
- ► Place the new board (of the same type) in the bay and press it carefully into the corresponding slot.
- ► Activate the PCI bay with the PCI locking mechanism. This also secures the board.
- ► If necessary, plug the cables in again.
- ► Select the *Add* function.

  The new board is operating when the status indicator in the PCI hot-plug utility indicates *OK*.
- ► Mount the hot-plug PCI cover (see the section “Removing/mounting the PCI bus hot-plug cover” on page 87).

8.5.2 Adding a PCI board

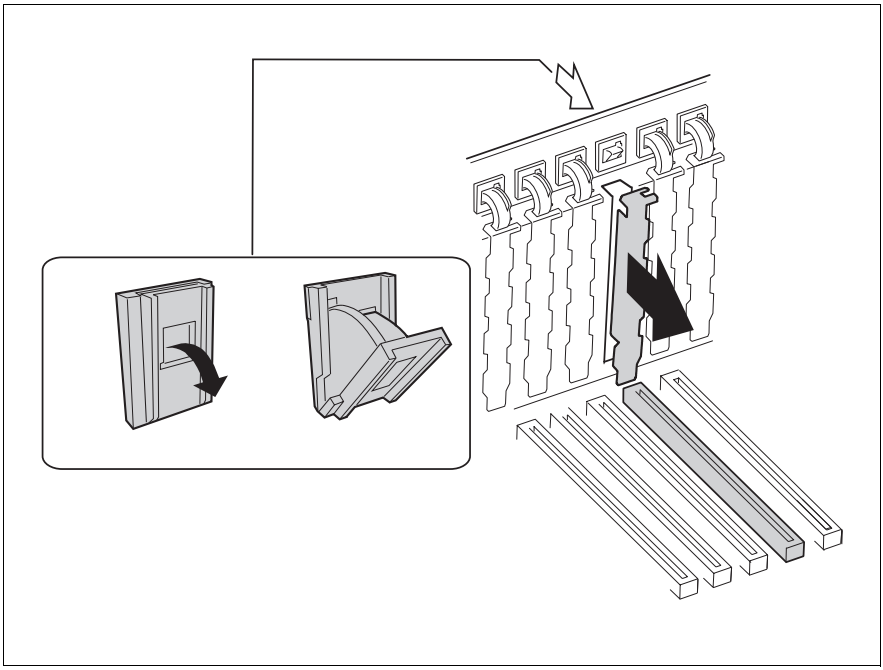

Figure 29: Removing the PCI slot cover

- ► Remove the hot-plug PCI cover (see the section “Removing/mounting the PCI bus hot-plug cover” on page 87).
- ► Release the PCI locking mechanism for the desired slot and remove the slot partition.

  CAUTION!

  Any unoccupied PCI slots must be equipped with partitions to ensure that the electromagnetic emission properties of the server are observed and that the server components are cooled properly.
- ► Start the PCI hot-plug utility from the Control Panel.
- ► If necessary, set jumpers and switches on the new board according to the instructions supplied by the manufacturer.
- ► Place the new board in the bay and press it carefully into the corresponding slot.

- ► Activate the PCI bay with the PCI locking mechanism. This also secures the board.
- ► If necessary, plug in the cables.
- ► Select the *Add* function.

  The new board is operating when the status indicator in the PCI hot-plug utility indicates *OK*.
- ► Mount the hot-plug PCI cover (see the section “Removing/mounting the PCI bus hot-plug cover” on page 87).

8.6 Processor expansion

Each Pentium III Xeon™ processor is packaged in a single edge contact (SEC) cartridge. The processor unit includes:

– the processor core with an integrated 16 KB primary (L1) cache

– the secondary cache (L2)

– the thermal plate

– the cover

The processor units are located on two processor carrier boards, which in turn are connected to the main processor carrier board. A processor carrier board can accommodate up to four processor units.

The server can accommodate up to eight Intel Pentium III Xeon™processors with a clock frequency of 550 MHz and/or 700 MHz and higher.

The 550 MHz processors are mounted on „Ocotillo mezzanine“ carrier boards, the 700 MHz and higher on „Palmetto mezzanine“ carrier boards.

CAUTION!

In order to prevent a damage of the processors, pay attention that the processors are mounted on the corresponding carrier boards only.

Processor units from 1MB to 2MB are available. Any free slots must be equipped with a front side bus (FSB) terminator.

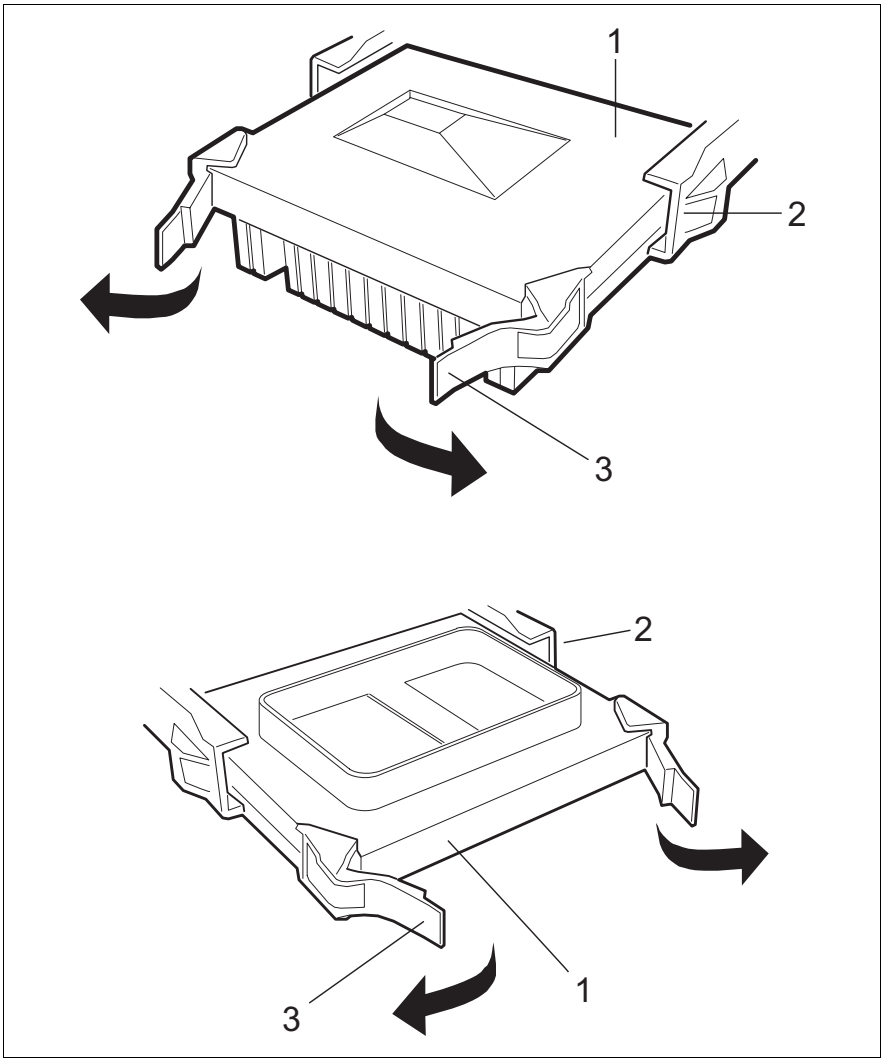

Figure 30: Processor unit and FSB terminator

1. Cover
2. Guide
3. Eject/insert lever

8.6.1 Removing/installing processor units

CAUTION!

Observe the safety information and the information on handling electrostatic-sensitive components in the chapter “Important notes” on page 11.

The processors can be extremely sensitive to electrostatic discharge (ESD) and always require careful handling. After removing a processor from its protective wrapper or from a processor carrier board, place it on a non conductive, static-free surface. Do not slide the processor over any surface.

► Remove the top cover (see the section “Removing/mounting the top cover” on page 88).

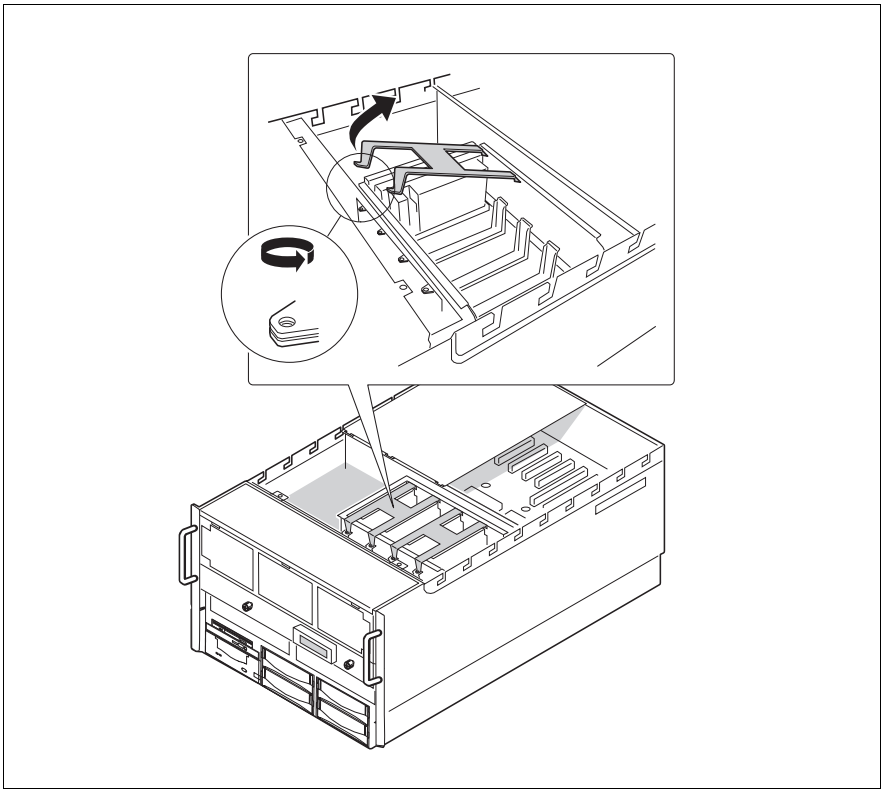

Figure 31: Removing the processor fastener

- ► The processor units and FSB terminator modules are secured by fasteners (one fastener for two processor units).

  Remove the appropriate fastener by removing the two screws and tilting the fastener in the direction of the arrow.

- ► Unlock the FSP terminator or processor unit by simultaneously rotating the two eject/insert levers (3) outward approximately 90° (see figure 30 on page 106) to eject the processor unit or terminator from the slot.
- ► Slide the terminator or processor unit out of the slot guides and place it thermal plate-side up on a non conductive, static-free surface or store it in an antistatic protective wrapper.
- ► Install a new processor or a terminator (in reverse order) in the empty slot.
- ► Secure the processor unit or terminator with the fastener (two screws).
- ► Replace the top cover (see the section “Removing/mounting the top cover” on page 88).

8.7 Memory expansion

Main memory resides on two carrier boards called memory modules. The memory modules are located under the control panel on the front of the server and are connected with the main processor carrier board via a connection modules.

Each memory modules contains slots for 16 DIMMs. The memory controller supports PC 100-registered SDRAM DIMMs. Three DIMM sizes are supported: 256 MB, 512 MB and 1 GB. Memory sizes from 256 MB to 16 GB per module are supported.

One to 32 DIMMs (total number of DIMMs for two memory modules) can be installed. Each memory module must be populated with an equal number DIMMs of (see also the section “Installing DIMMs” on page 110) unless only one DIMM is used.

If only one memory module is installed, DIMM sizes on that module may vary, but if both memory modules are installed, the DIMM configuration on the two modules should be identical to support memory interleaving for performance gains.

The system operates in two different modes depending on how many memory modules are installed:

– Interleaved mode (two memory modules): The memory modules share a common address range. One memory responds to even-numbered cache lines, while the other responds to odd-numbered cache lines. This configuration offers the highest performance because it allow the two modules to be used in a balanced fashion, reducing address conflicts.

  In interleaved mode, the DIMMs must be installed in pairs (one on each module) and in the same locations (Jx) on each module (see figure 32 on page 109).

– Single port mode (one memory module): The single memory module responds to all memory addresses. The DIMMs on this single carrier do not need to be installed in pairs.

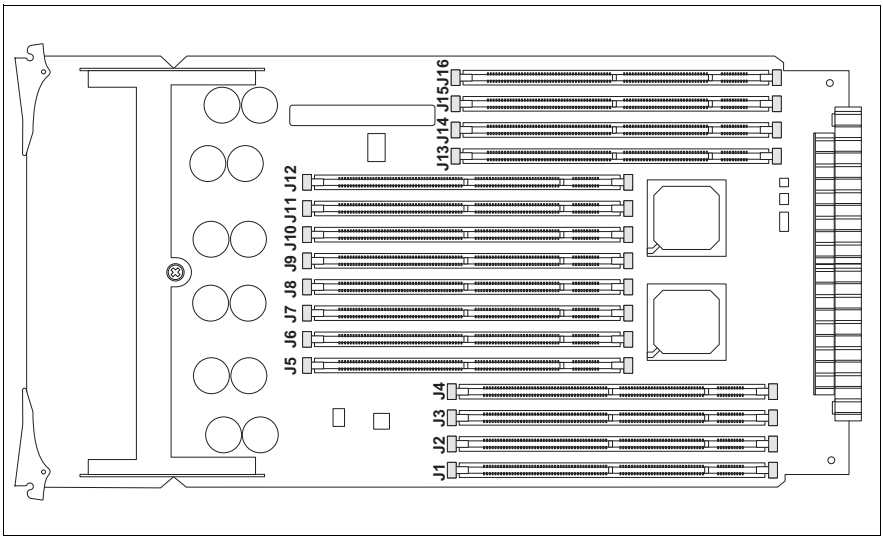

Figure 32: Main memory module

8.7.1 Installing DIMMs

A single memory module will support DIMM population in various configurations (including empty sockets). However, if fewer than 16 DIMMs are installed on a module, the preferred population order is in groups of four sockets (Jx) (see also figure 32 on page 109):

Step	Occupied sockets
1	J1-J5-J9-J13
2	J2-J6-J10-J14
3	J3-J7-J11-J15
4	J4-J8-J12-J16

This recommendation ensures optimum performance, signal integrity and cooling.

The maximum capacity is limited to 16 GB if only one module is installed. The capacity increases to 32 GB if two modules are used.

BIOS automatically detects, sizes and initializes memory (conventional and extended memory) according to the type, size and speed of the installed DIMMs and reports memory size and allocation to the system via the configuration registers.

CAUTION!

Observe the safety information and the information on handling electrostatic-sensitive components in the chapter “Important notes” on page 11.

Use extreme care when installing a DIMM. Too much pressure can damage the ejector levers.

The DIMMS are equipped with coded connectors so that they cannot be installed incorrectly.

► Remove the DIMM from its antistatic package.

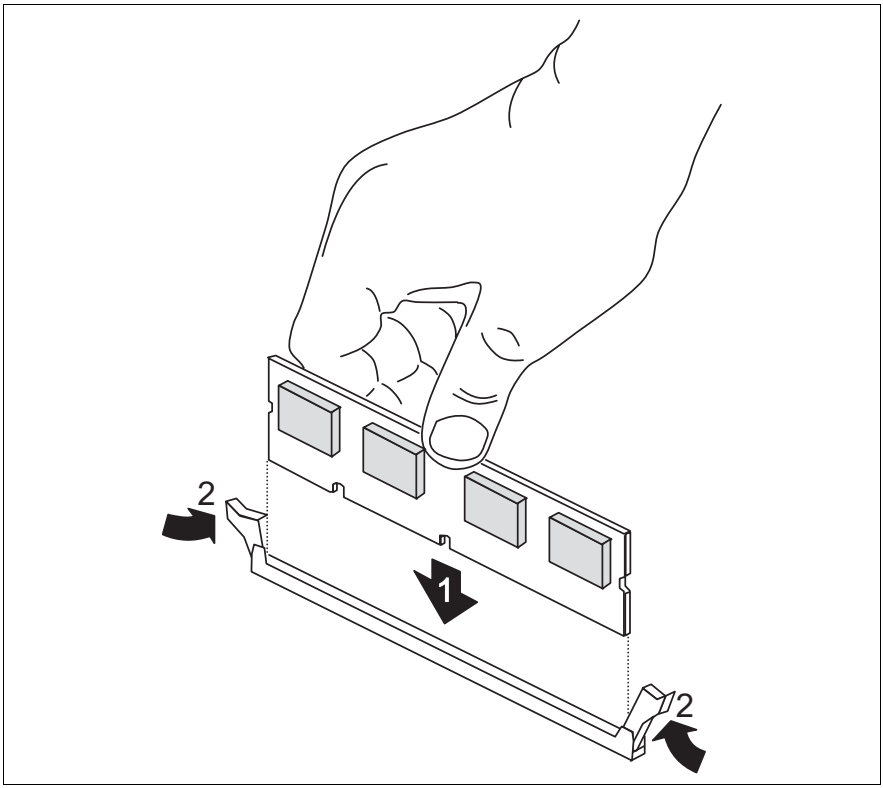

Figure 33: Installing DIMMs

- ► Position the DIMM so that the two notches on the bottom edge align with the socket (J1-J16) on the module. Insert the DIMM into the socket and press down firmly until it is seated correctly (1).
- ► Secure the DIMM by carefully pushing the two levers (2) to an upright position.

The DIMMs are removed in reverse order.

CAUTION!

Use extreme care when removing a DIMM. Apply only enough pressure on the ejector levers to release the DIMM.

8.7.2 Removing a memory module

CAUTION!

Observe the safety information and the information on handling electrostatic-sensitive components in the chapter “Important notes” on page 11.

► Remove the front bezel (see the section “Removing the front bezel” on page 85).

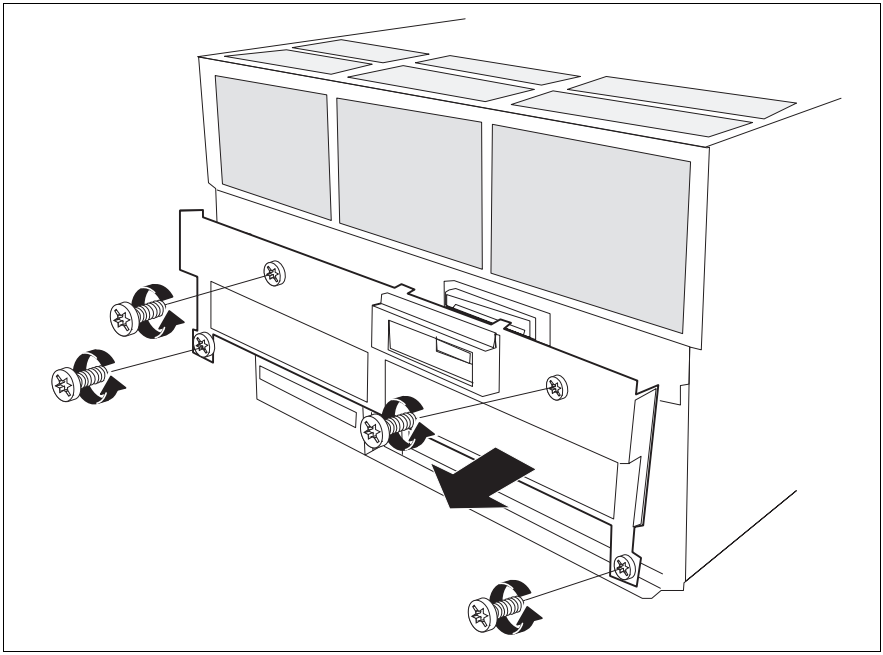

Figure 34: Removing the memory module cover

► Remove the memory module cover by removing the four fastening screws and carefully sliding the cover in the direction of the arrow.

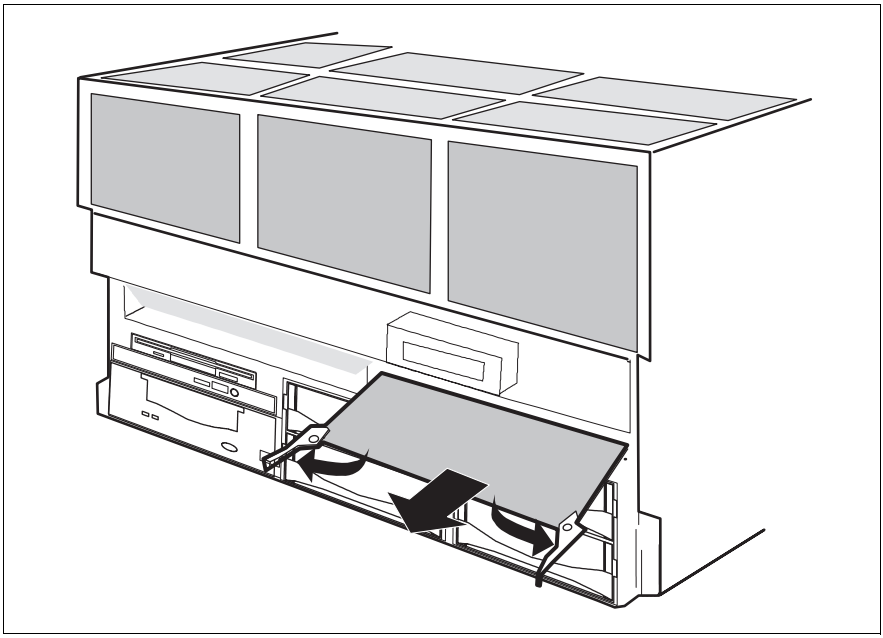

Figure 35: Removing a memory module

► Release the module by simultaneously rotating the eject/insert levers outward 90° and remove the module from its slot in the direction of the arrow.

CAUTION!

Support the entire length of the module as you remove it. The module is more than 30 cm long and could be damaged if you allow it to bend by supporting only one end.

8.7.3 Installing a memory module

- Populate the module you have just removed with the additional DIMMs (see the section “Installing DIMMs” on page 110).

  If you are installing an additional module, this must be populated with the DIMMs before installation.

  Install the module with the component side down.

- Open the insert/eject levers of the module (by rotating them outward 90°) and slide the module into the slot guides of the empty slot until the levers engage with the flanges in front of the guides.
- Simultaneously rotate the levers inward until they are flush with the edge of the module.
- Mount the memory module cover (four screws) and the front bezel).
- Use *BIOS Setup* to configure the system and if necessary specify the correct, expanded memory attributes.

8.8 RemoteView storage medium

For use *RemoteView*, the remote test and diagnosis system, on the N800 servers an optional RemoteView IDE storage medium (chipDISK for RemoteView) is available.

The IDE storage medium is either pre-installed in the delivered server or is included in the delivery unit as a separate component. This depends of the way *RemoteView* has been ordered. The installation of the ChipDISK should only be executed by service technicians.

Usually the IDE storage medium is shipped with the *RemoteView*/Diagnosis System pre-installed.

A supplementary order of a ChipDISK do not contains the pre-installed *RemoteView*/Diagnosis System.

8.8.1 Configuring the RemoteView storage medium

So that *RemoteView* can be started automatically later, enter the parameters of the storage medium in the BIOS setup. To do this, proceed as follows:

- ► Restart the server.
- ► Press function key F2 when the message *Press <F2> to enter SETUP* appears on the screen. You will find notes on this procedure in section “BIOS Setup” on page 47.
- ► Select in the Main menu of the BIOS setup the Primary Master and the Primary Slave submenu (see section 5.3.3 on page 51).

  For both, Primary Master and for Primary Slave the value for *Type* **has to be** set to *auto* as default

  i With this default settings the IDE ChipDISK is not „visible“ as drive in the standard administration environment (e. g. windows explorer).
- ► Start *RemoteView* via the *ServerView* restart option *Boot Diagnostic System*.
- ► End *RemoteView* with menu item *Boot Original OS*.

The server then boots the standard operating system. You can find how to operate *RemoteView* in the manual for *RemoteView*.

i Should the RemoteView software not yet be installed on the IDE storage medium, then install the software as described in the manual for *RemoteView*.

8.9 Remote Service Board

In connection with the optional Remote Test and Diagnosis System *RemoteView*, a so-called Remote Service Board (RSB) can be installed. In this case remote diagnosis is available to the customer or service provider for analysis, remote system configuration and a remote restart - even if the operating system or the hardware fails.

The RSB is a PCI board which includes a completely independent system. It has a separate operating system with web server and SNMP agent, and can be driven optionally by an external power supply or by a battery pack.

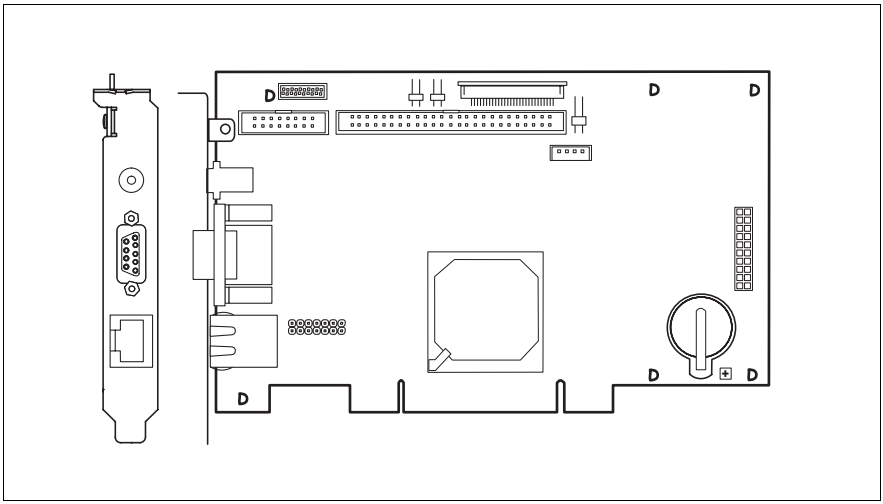

Figure 36: RemoteView Service Board

The board is installed in a PCI slot and connected to the I/O board.

CAUTION

The RSB can only be mounted when the system is switched off (no PCI hot-plug-able).

The RSB must be mounted on the PCI slot number 2 only.

Further informations is provided in the documentation for the Remote Service Board (see “Related publications” on page 125).

9 SCSI configurations

9.1 Addresses for SCSI devices

All devices attached to the SCSI port or a SCSI controller (hard disk and other drives) must have a unique address, known as the SCSI ID. When attaching drives, make sure you do not allocate an ID which has already been assigned.

The SCSI IDs for the backup drives are set on the drive. For this drives the SCSI-ID 6 are assigned.

All the necessary SCSI terminations are already installed on the server. No terminations may be plugged in to the drives.

The SCSI IDs for the hard disk drives are not set on the drive itself, but determined by the slot on the SCSI backplane.

The two slots of the hard disk drives lead to a SCSI backplane. The hard disk drives are connected in series to a channel (SCSI ID 0: left drive, SCSI ID 1: right drive). The two lower drives are connected to the SCSI channel A, the two upper drives to the SCSI channel B.

configuration	**SCSI-IDs**	
	left drive	**right drive**
Channel B (above)	0	1
Channel A (below)	0	1

Table 27: SCSI IDs

9.2 Internal SCSI configurations

Configuration with dual onboard SCSI controller (default)

The server has one dual onboard LVD/U2W-SCSI controller. Each of the SCSI channels is connected with one SCSI backplane (lower backplane with channel A and/or the upper with channel B).

An optional SCSI SE backup drive is connected to the lower SCSI backplane.

Configuration with 2-channel and/or 3-channel Disk Array Controller

The controller is installed into a PCI slot. The SCSI channels are connected each with one of the SCSI backplanes (two hard disk drives each).

One free SCSI channel of the onboard LVD/U2W-SCSI controller is available for the optional SCSI SE backup drive.

The second free SCSI channel of the onboard LVD/U2W-SCSI controller can become used for external disk drives.

Supplementary channels of the disk array controller are available for external hard disk drives systems.

Abbreviations

ANSI
American National Standard Institute

ASR&R
Automatic Server Reconfiguration and Restart

BIOS
Basic Input-Output System

BMC
Baseboard Management Controller

CAN
Controller Area Network

CC
Cache Coherency

CD
Compact Disk

CD-ROM
Compact Disk-Read Only Memory

CHS
Cylinder Head Sector

CMOS
Complementary Metal Oxide Semiconductor

CPU
Central Processing Unit

DAC
Disk Array Controller

DC
Direct Current

DIMM
Dual Inline Memory Module

DIP
Dual Inline Package

DMA
Direct Memory Access

DMI
Desktop Management Interface

ECC
Error Checking and Correcting

ECP
Extended Capabilities Port

EEPROM
Electrically Erasable Programmable Read-Only Memory

EMP
Emergency Management Port

EPP
Enhanced Parallel Port

ESD
ElectroStatic Discharge

FPC
Front Panel Controller

FRU
Field Replaceable Unit

FSB
Front Side Bus

GUI
Graphical User Interface

HSC
Hot-Swap-Controller

I/O
Input/Output

ICM
Intelligent Chassis Management

IDE
Intergrated Drive Electronics

IRQ
Interrupt Request Line

LBA
Logical Block Address

LCD
Liquid Crystal Display

LUN
Logical Unit Number

LVDS
Low-Voltage Differential SCSI

LWL
LichtWellenLeiter

MMF
Multi Mode Faser

NMI
Non Mascable Interrupt

NVRAM
Non Volatile Random Access Memory

OS
Operating System

PCI
Peripheral Component Interconnect

PDA
Prefailure Detection and Analysing

POST
Power ON Self Test

RAID
Redundant Arrays of Independent Disks

RAM
Random Access Memory

ROM
Read-Only Memory

RSB
Remote Service Board

RTC
Real-Time Computer

RTDS
Remote Test- und Diagnose-System

SAF-TE
SCSI Accessed Fault-Tolerance Enclosures

SBE
Single Bit Error

SCA
Single Connector Attachment

SCSI
Small Computer System Interface

SDR
Sensor Data Record

SEL
System Event Log

SMI
System Management Interrupt

SSU
System Setup Utility

SVGA
Super Video Graphics Adapter

USB
Universal Serial Bus

VGA
Video Graphics Adapter

Related publications

Please apply to your local office for ordering the manuals.

[1] **Safety, Warranty and Ergonomics**

[2] **19-Zoll-Rack/19 Inch Rack**
Technisches Handbuch/Technical Manual

[3] **DataCenter Rack**
Technisches Handbuch/Technical Manual

[4] **PRIMERGY S40-DF Storage Subsystem**
Operating manual

[5] **CAN-MMF**
CAN Multi Mode Faser
Technisches Handbuch/Technical Manual

[6] **ServerView 2.x**
Server Management
User Manual

[7] **ServerView Extension**
ServerView Extension für HP OpenView NNM

[8] **ServerView/Plus für Tivoli 1.x**

[9] **RemoteView Version 2.x**
User Manual

[10] **Remote Service Board**
Installationsanleitung/Installation Guide

Index

A
addresses for SCSI devices 117
ASR&R 3
Automatic Server Reconfiguration and Restart 3
availability 3

B
batteries, disposal 16
BIOS
  changing the language 70
  recovering 70
  upgrade 68
BIOS Setup 47
  calling 48
  menu 49
board
  replacing in the hot-plug PCI slot 101
buttons
  locking 74

C
cable clip 20, 27
cables
  connecting 25
  disconnecting 25
  routing 26
cage nuts 20
CAN bus 29
CAN bus connection 31
CAN MMF 30
CD-ROM
  open/close button 35
  power-on indicator 35
  volume control 35
CE certificate 14
CE certification 10
certification 10
chipDISK 114
  configuring 115
cleaning
  screen, mouse, server, keyboard 43
configuration software 45
configuring
  server 38
consumables 16

D
data protection 73
date
  incorrect 78
devices
  connecting to server 28
dimensions 9
disk array controller (DAC)
  not configured for drive 79
disposal, of devices 17
drive
  defective 79
  reported "dead" 79
dummy modul
  SCSI hard disk drive 92

E
electrical data 9
electromagnetic compatibility 10
EMC directive 10
EMC regulations 92
environmental conditions 9
environmental protection 16
ergonomics 10
error
  display drifts 77
  drive defective 79
  drive reported "dead" 79
  flickering stripes on screen 77
  floppy disk cannot be read/written 78
  incorrect date 78
  incorrect time 78

no display on screen 77
no mouse pointer 77
screen remains dark 76
server switches itself off 76
system will not boot 78
Error Checking and Correction 3
error message
on screen 79

F

failure protection 3
fan failure indicator 34
fault
display drifts 77
drive defective 79
drive reported "dead" 79
flickering stripes on screen 77
floppy disk cannot be read/written 78
incorrect date 78
incorrect time 78
no display on screen 77
no mouse pointer 77
screen remains dark 76
server switches itself off 76
system will not boot 78
faults
correcting 75
FCC notices 14
features 2
floppy disk
cannot be read/written 78
floppy disk drive
eject button 35
power-on indicator 35
floppy disk write protection 74

G

graphics card 29

H

hard disk drive 89
hard disk slide-in module
3½-inch 2
hard disk subsystem 2
hard disks
hot-replace-capable 3
height units, server 20
hot-plug
hard disk drive 89
hot-plug PCI 3
adding boards 104
functionality 100
replace utility 100
replacing boards 101
status indicator 100
hot-plug PCI slot 99

I

indicator
drive error 34
fan failure 34
hot-plug PCI 99
power failure 34
power-on indicator remains dark 75
installation
PCI hot-plug software 71
interference emission 10
interference immunity 10

K

key combination
short cuts 45

L

labels, on plastic housing parts 16
LCD indicator 34
LED
hot-plug PCI 35
LEDs
PCI indicators 100

M

mains
connecting the server 31
maintenance surfaces 10
memory

expansion 108
installing DIMMs 110
installing modules 114
module 109
removing memory module cover 112
removing modules 112
Memory Scrubbing 3
module
memory 109
mounting 20
mouse
no mouse pointer on screen 77
multimode fiber 30

N
NMI button 34
noise level 10
non-maskable interrupt 34
notational conventions 7
notes on safety 11

O
ON/OFF switch 34
operating system
installing 38
optical fiber transmission 30
overloads 4

P
packaging 16
password protection 73
PCI hot-plug
installing software 71
PDA 3, 4
plastic housing parts, labels 16
ports
of server 28
POST (Power-ON Self-Test) 45
power failure indicator 34
power supply unit
status indicator 94
power-on indicator 34
remains dark 75
Power-ON Self-Test (POST) 45
Prefailure Detection and Analysing 3
processor
expansion 105
FSB terminator 107
installing unit 107, 108
unit 105
product safety 10
property protection 73

R
RAID controller 89
RAID level 93
recycling, of devices 17
Remote Service Board (RSB) 116
RemoteView 31, 114
replace
hot-plug PCI board 101
reset button 34
restart the system 34
RFI suppression 14
RSB (Remote Service Board) 116

S
saving energy 16
screen
blanking 74
display drifts 77
error message 79
flickering stripes 77
flickers 77
no display 77
remains dark 76
SCSI configurations 117, 118
SCSI devices
SCSI IDs 117
SCSI hard disk drive
dummy modul 92
status indicators 90
SCSI ID 117
server
configuring 38
connecting external devices 28
connecting to the mains 31

height units 20
mounting in the rack 20
ON/OFF switch 34
ports 28
switches itself off (error) 76
switching on/off 37
troubleshooting 75
unpacking 19
server management 4
ServerView 4, 30
supported functions 4
Single Connector Attachment 2
software
BIOS Setup 47
configuration software 45
Power-ON Self-Test (POST) 45
utilities 45
spring nuts 20
standards 10
summary of contents 6
switching off
server 37
switching on
server 37
switch-off time
specified 37
switch-on time
specified 37
system expansion
RemoteView storage medium 114
system will not boot 78

T
take-back, of devices 17
target group 5
technical data 9
time
incorrect 78
troubleshooting
server 75

U
unpacking 19
utility 45
hot-plug PCI replace 100
installing graphic drivers 71
installing PCI hot-plug software 71
Symbios SCSI 71

V
ventilation clearances 10

W
weight 9
write protection
floppy disk 74

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Comments
Suggestions
Corrections

Submitted by

Comments on PRIMERGY N800
Server System

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